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A Novel Approach to Treating Anxiety and Enhancing Executive Skills in an Older Adult with Parkinson's Disease

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Abstract

Scientific interest in the nonmotoric symptoms of Parkinson's disease (PD) has increased dramatically, and psychiatric symptoms (e.g., cognitive impairment, anxiety and mood disorders) are now considered prime targets for treatment optimization. Psychiatric complications in PD are quite common, affecting as many as 60 to 80% of patients. This study describes the case of a 74 year-old male with PD who presented with complaints of anxiety and trouble with memory and attention. A combined cognitive behavior therapy and cognitive enhancement intervention was delivered in ten 90-to-120 minute sessions. The patient showed a reduction in anxiety symptoms that was of sufficient magnitude to meet criteria for 'responder' status. His cognitive skills were mostly unchanged, despite the rigorous rehabilitation practice. Implications for treatment and strategies for enhancing therapeutic benefits are discussed.

Keywords

Parkinson's disease; aging; cognitive behavior therapy; anxiety; executive skills; cognitive enhancement

1. Theoretical and Research Basis

Given the rapid increase in the world's population of older adults (Kinsella & Velkoff, 2001), diseases associated with advancing age may soon move to the forefront of mental health

research. Idiopathic Parkinson's Disease (PD) is a progressive neurodegenerative disorder, most often emerging in middle to later adult life and characterized by the motor triad of tremor, rigidity, and bradykinesia (slowness of movement). Postural instability may develop as the illness progresses, leading to a higher incidence of falls, balance problems, and difficulties standing or walking without assistance. Dyskinesias (abnormal involuntary movements) and on-off phenomena (sudden, unpredictable changes in motor function) are notable side effects of the dopaminergic replacement therapy (DRT) commonly used to treat PD that may further complicate the clinical picture (Mark, 2006).

Although PD is considered a movement disorder, scientific interest in the nonmotoric symptoms of PD has increased dramatically, and psychiatric symptoms (e.g., cognitive impairment, anxiety and mood disorders) are now considered prime targets for treatment optimization (Marsh, 2000). Psychiatric complications in PD are quite common, affecting as many as 60 to 80% of patients (Kulisevsky et al., 2008), negatively impacting functional status, quality of life, and family relationships (Shulman et al., 2001; Weintraub & Stern, 2005). Psychiatric concerns in PD are associated with higher levels of distress and disability than the impairment caused by the motor symptoms (Forsaa, Larsen, Wentzel-Larsen, Herlofson, & Alves, 2008).

In particular, emergent data highlight underrecognized but serious deleterious effects of anxiety and cognitive deficits in PD patients (Riedel et al., 2008). PD is most often characterized by deficits in executive skills (ESs), complex cognitive skills involved in goal-directed behaviors (e.g., the sequencing and execution of everyday tasks like cooking) and the regulation of emotion (e.g., focusing and shifting attention; Fuster, 1997). Problems with ESs are found even in non-demented and recently diagnosed PD patients (Ehrt & Aarsland, 2005; Leroi, Collins, & Marsh, 2006). ESs deficits reduce quality of life (Thommessen et al., 2002) and are associated with visual hallucinations (Fenelon, Mahieux, Huon, & Ziegler, 2000), misperceptions of symptom severity and uncontrollability, and other impairing symptoms such as decreased motor control (Schrag & Jahanshahi, 2004) and functional disability (Spear Bassett, 2006). ESs may also predict response to pharmacotherapy (Alexopoulos, Kiosses, Klimstra, & Kalayam, 2002) and cognitive behavior therapy (CBT; Mohlman & Gorman, 2005), which are the most effective strategies for treating anxiety in the geriatric population. The efficacy of pharmacological interventions for treating cognitive deficits in PD is variable, with a subset of trials indicating little to no improvement (Rektorova et al., 2003); thus, investigating behavioral methods is both timely and warranted.

Debilitating anxiety symptoms are also experienced by an estimated 40% of PD patients, as part of the disease itself, in response to the disease, and as a side effect of DRT (Marsh, 2000; Walsh & Bennett, 2001). Some have even proposed a common neuropathology of PD and anxiety states such as panic disorder (Lauterbach, Freeman, & Vogel, 2003). Like ESs deficits, anxiety contributes to decreased quality of life and is related to motor fluctuations (Richard et al., 2004). Greater frequency and severity of ESs deficits have been found among PD patients with elevated anxiety as compared to those without (Marsh et al., 2000). Increased anxiety is associated with premature termination of participation in PD support groups, which are currently the most widely utilized psychosocial intervention by this particular group of patients (Lieberman, 2007). Despite increased prevalence of anxiety in PD relative to the general population and other patient groups, it has received far less attention than other psychiatric problems as a treatment target and as a result, very little is known about the behavioral mitigation of anxiety in PD.

There is clearly a pressing need to develop interventions that target these impairing nonmotoric symptoms, which would mark a new direction in the treatment of PD. The ultimate aim of this report was to describe a case in which we attempted to enhance ESs and reduce anxiety in a

patient with PD, using nonpharmacological methods. The intervention consisted of two components: CBT, an efficacious intervention for anxiety in older adults (Mohlman, 2004), and Attention Process Training II (APT; Sohlberg, Johnson, Raskin, & Mateer, 2001), a cognitive rehabilitation package shown to be effective for treating ESs deficits in various patient groups. Because pharmacological studies show variable results and many patients do not wish to add additional medications to their daily regimen, the current findings could lead to a viable and appealing alternative for treating anxiety and cognitive deficits in PD (Leroi et al., 2006).

Details of the CBT/APT Intervention

CBT/APT is a 10-session intervention (90 to 120 min per session) comprised of a CBT component (5 sessions) and an ESs training module (5 sessions). The CBT component was chosen to target anxiety in PD because it is more effective for treating anxiety than supportive therapy and most medications (Mitte, Noack, Stell, & Hautzinger, 2005; Stanley, Beck, & Glassco, 1996), and pilot data suggests it may be effective for treating symptoms of depression and anxiety in PD (Dobkin, Allen, & Menza, 2006; Feeney, Egan, & Gasson, 2005). In-session assignments included cognitive restructuring, progressive muscle relaxation, and behavioral exercises such as exposure to anxiety-provoking activities and situations. Homework assignments included daily mood records, three components model of anxiety worksheet, relaxation logs, cognitive restructuring, worry and anger behavior logs, sleep hygiene training, and gradual exposure to anxiety provoking situations (see Table 1). This CBT protocol led to clinically significant improvement in 75 to 86% of anxious older adults in several earlier pilot studies (Mohlman et al., 2003; Mohlman & Gorman, 2005).

The APT component of CBT/APT was hierarchically designed such that basic cognitive skills were constantly stimulated while newer, more complex skills were targeted and exercised, and the package included modules that facilitated the transfer and generalization of skills to real life activities and situations (e.g., simultaneously cooking and talking on the phone or walking while engaging in mental calculation). Tasks were selected for their ability to target four types of attention that are commonly disrupted in PD (i.e., sustained, selective, divided, alternating). APT was chosen because it is readily available, easy to administer, and has empirical data to support its efficacy. APT is comprised primarily of audio compact discs that participants can easily use at home without technical support or the need for fine motor skills (e.g., typing or writing, both of which are difficult for some people with PD). APT has been successfully used as a cognitive enhancing strategy in patients with traumatic brain injury (Palms & Raskin, 2000; Pero, Incoccia, Caracciolo, Zoccolotti, & Formisano, 2006; Sohlberg, McLaughlin, Pavese, Heidrich, & Posner, 2000), schizophrenia (Silverstein et al., 2005), and aphasia (Coelho, 2005). If CBT/APT proves to be effective, then the availability of APT will enhance the portability of the intervention to other environments and modes of administration.

CBT/APT (Mohlman, 2008) was initially compared to standard CBT in a small sample of 8 medically healthy generalized anxiety disorder (GAD) patients with low ESs scores, age 60 to 74 (mean age = 66.4). In this initial study, half of each session was devoted to CBT and the other half to APT; thus, participants practiced both sets of skills in each session. Treatment took place across ten weeks (eight 90-min sessions). At posttreatment, all four randomized to CBT/APT were classified as responders, versus two of the four in CBT. The CBT/APT group evidenced significantly more improvement on ESs and a weekly measure of worry than CBT. Additionally, three of the four CBT/APT participants scored within one standard deviation of the normal mean on 3 anxiety measures at six-month follow up, indicating enhanced benefits over time.

The present case illustrates main aspects of the CBT/APT and its relevance to treating nonmotoric symptoms of PD. The patient, Mr. R., was enrolled in a clinical trial comparing

the combined CBT/APT intervention with modules delivered serially, in either of two possible orders: five sessions of CBT followed by five sessions of APT; or five sessions of APT followed by five sessions of CBT. Based on patient feedback from the aforementioned study indicating that it was at times somewhat difficult to shift midsession from one module's skill set to the other's, we opted to deliver modules serially as opposed to concurrently. The theoretical basis for the original test of the intervention (Mohlman, 2008) made the argument that ESs are important for the successful use of CBT, given that the therapy hinges on one's ability to engage in many complex cognitive activities, such as self monitoring, metacognition, and dividing attention (e.g., Hariri, Bookheimer, & Mazziotta, 2001). Moreover, GAD is not associated with ESs deficits and there was no strong evidence that reducing anxiety would reliably improve ESs (Mohlman & Gorman, 2005). Thus, it may be most beneficial to deliver the APT component first. In PD, however, anxiety and cognitive impairment are related, with scores on an anxiety measure (but not a depression measure) showing significant negative relations to all tests of cognitive functions in a comprehensive battery (Ryder, Gontkovsky, McSwan, Scott, Bharucha, & Beatty, 2002). This relation might be explained by the depletion of dopamine (DA) in frontal areas (Cools, 2006, Levy & Cummings, 2000), which could contribute to both anxiety and ESs impairment. Thus, it is also possible that initial reduction of anxiety in PD will lead to improvement in ESs in the absence of cognitive training. These were empirical questions being tested in the clinical trial, and the serial delivery scheme was used to determine whether order of modules is an important factor in this particular treatment strategy. Mr. R. was randomly assigned to receive CBT followed by APT.

2. Case Presentation

Mr. R. was a 74-year old, married white male who was diagnosed with PD in 2003 (six years prior to presentation for treatment), and at the time of treatment, his Hoehn and Yahr stage¹ was 2, indicating the bi-lateral tremor and rigidity with no impairment of balance. He lived with his wife in central New Jersey, and had two grown sons from a previous marriage. Prior to college, Mr. R. was a member of the U.S. Navy for five years. After his military tour of duty, he earned an M.A. in Humanities and American History and worked as a journalist and then as a guitar teacher until his retirement in 1999. At the time of treatment, he worked as a landlord, leasing several properties that he owns. He was self-referred to the program after receiving a recruitment flyer in a PD support group he attended. He recognized in himself a number of the symptoms and behaviors described in the flyer and thought the program would be helpful in making positive changes.

3. Presenting Complaints

Diagnostic information was collected at a university-based mental health clinic in the northeast. Mr. R. reported that he had never been formally diagnosed with any psychiatric disorders, but that he had a long history of treatment for anxiety and depression, spanning most of his adult life and predating his PD. By his report, the majority of his previous treatments included psychodynamic and group process therapy and were largely ineffective. Mr. R.'s primary complaint was of excessive, uncontrollable worry. Many of his worries concerned his wife (e.g., whether she really loved him, what she would do when he was gone). Mr. R. reported physical symptoms of anxiety including heart pain (in the absence of any diagnosable cardiovascular problem), stomach discomfort, muscle tension, feeling restless and keyed up, and insomnia. He also constantly worried about interpersonal relationships and how others

¹The Hoehn and Yahr (1967) scale is a 5 point scale used to assess the stage of progression (i.e., stage 1–5) of PD (1= unilateral disease, 1.5= unilateral disease plus axial involvement, 2= bilateral disease without impairment of balance, 2.5= mild bilateral disease with recovery on pull test, 3= mild to moderate bilateral disease; some postural instability; physically independent, 4=severe disability; able to walk or stand unassisted, 5=wheelchair bound/bedridden unless aided).

regarded him (whether they liked him and saw him as smart, capable, etc.) and about his health, especially about perceived declines in his cognitive abilities (e.g., his memory and ability to think clearly).

Another major concern was that his PD symptoms felt “out of control.” This was (in his opinion) mostly due to fluctuations brought about by his dopamine replacement medication, associated with rapid changes in rigidity and tremor, often the result of the “wearing off” of medication effect prior to the next scheduled dose. Mr. R.’s “off periods” typically included an increase in motor symptoms of bradykinesia and tremors, which seemed to correspond to fluctuations in anxiety and pain.

Mr. R. also reported concerns about cognitive functioning. He felt that his mental abilities were “slipping” in recent years, and was not able to think as clearly and critically as he used to when he was working and before he was diagnosed with PD. He reported that he has had increasing episodes of short-term memory loss and difficulty in finding words to express his thoughts.

4. History

Mr. R. reported that to the best of his knowledge, none of his immediate family members had ever been formally diagnosed with any psychiatric disorder. However, he reported that his mother was clearly “mentally ill” and “extremely controlling.” He reported a great deal of verbal abuse from her as a child, but reported no history of physical or sexual abuse. He has two brothers and one sister who were “scattered across the country,” with one brother living relatively nearby in Pennsylvania. By his report, he had friendly contact with his siblings several times per year, but was not very close with any of his extended family. Mr. R. reported that his relationships with his two adult sons had become strained, as he believed his current wife was jealous and resentful of them due to her own inability to have children. Mr. R. felt apprehensive about reestablishing regular contact with his children and grandchildren, as he worried that it may lead to his wife feeling alienated or threatened.

5. Assessment

The *Structured Clinical Interview for DSM-IV* (SCID-IV; First, Gibbon, Spitzer, & Williams, 1995) was administered by the first author (J.M.) during Mr. R.’s intake. On the basis of the information obtained, a principal diagnosis of Generalized Anxiety Disorder was assigned. (GAD, DSM-IV 300.02; American Psychiatric Association, 2000). He did not meet criteria for any comorbid psychological conditions.

Mr. R. completed two clinician-rated measures, the Hamilton Scales for Anxiety (Ham-A; Hamilton, 1959) administered with the Structured Interview Guide for the Hamilton Anxiety Rating Scale (SIGH-A; Shear et al., 2001), and Hamilton Scales for Depression (Ham-D; Hamilton, 1960) administered with the Structured Interview Guide for the Hamilton Depression Rating Scale (SIGH-D; Williams, 1988). Study assessors matched with the gold standard (J.M., who had ten years’ experience using the Ham-A) within two points on 100%, and within one point of the total score on 85%, and exactly on 75% of three independently conducted Ham-A interviews. Mr. R.’s scores on both the Ham-A and Ham-D were elevated.

Mr. R. completed a battery of psychometric scales comprised of the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990), the Beck Anxiety Inventory (BAI; Beck & Steer, 1990), the trait scale of the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and the Beck Depression Inventory (BDI; Beck & Steer, 1987). As shown in Table 2, scores on all baseline measures indicated moderate to severe levels of anxiety and moderate levels of depression. Both self- and clinician-

rated instruments were used because certain anxiety scales may overestimate the severity of psychiatric symptoms in PD (Higginson, Fields, Koller, & Troster, 2001).

Mr. R. also completed a battery of neuropsychological tests comprised of the Mini Mental State Exam (Folstein, Folstein, & McHugh, 1975), the Boston Naming Test (Kaplan, Goodglass, & Weintraub, 1983), Stroop Task (Trenerry, Crosson, DeBoe, & Leber, 1989), Controlled Oral Word Association Test (COWAT; Benton & Hamsher, 1976), Trailmaking Test (Army Individual Test Battery, 1944), and several subtests from the Wechsler Adult Intelligence Scales (i.e., Digit Span, Verbal Paired Associates, Similarities, and Digit Symbol; Wechsler, 1997). Despite subjective complaints of memory and concentration problems and reports of ongoing decline in cognitive abilities, most of his test scores were above average for his age and education, indicating no substantial cognitive deficits (see Table 3). However, his performance was in the low average or average range on nonverbal ESs tests, which might signal a relative weakness, especially in light of his strong performance on tests tapping verbal abilities.

A current controversy in the realm of cognitive aging is whether or not it is beneficial to use cognitive enhancement interventions with adults who are free of deficits. We believe that testing these strategies (even in unimpaired older adults) is low risk and may even lead to novel findings in maintaining and enhancing benefits in later life, as indicated by the burgeoning literature on neurogenesis (McDougall, 2009). There are currently no approved medications for enhancing cognitive functions in nondemented elderly, which underscores the need for testing behavioral strategies. Also of potentially great importance is the fact that maintaining cognitive abilities is an important step in preventing subsequent functional decline and caregiver burden (Tariot, 2001), and we speculated that ESs training might act as a palliative for cognitive decline in PD, although this was admittedly speculative.

6. Case Conceptualization

Mr. R.'s primary complaints of obsessional thoughts and worry, somatic symptoms, and memory and other cognitive difficulties may be attributable to several interrelated factors. Because many of his symptoms (e.g., insomnia, worry) reportedly traced back many years and predated the diagnosis of PD, it is likely that a complex interaction of a genetic predisposition, the neurobiology of PD, aging, life-stressors, living with a chronic illness, and psychological vulnerabilities (e.g., lack of coping skills, anxiogenic core beliefs) thought to be associated with anxiety disorders have played a role in his anxiety (Barlow, 2002). Due to symptom overlap between PD, anxiety, and side effects of DRT, one ultimate cause cannot be identified (Menza & Dobkin, 2005).

While the ultimate origins of Mr. R.'s symptoms were difficult to ascertain, several maintenance factors were identified. Mr. R. frequently engaged in excessive and unproductive worrying. His worries about such matters as his interpersonal relationships, health, and PD-related decline and inabilities were therefore identified as an important treatment target. He exhibited cognitive distortions of catastrophizing, dichotomous thinking, mind reading, and disqualifying the positive (Burns, 2000). Mr. R. also engaged in avoidance behaviors, such as avoidance of exercise for fear of having a heart attack. His anxiety also appeared to be maintained by excessive reassurance seeking from his wife as well as from friends and doctors.

Based on Mr. R.'s presenting symptoms and presence of clear cognitive and behavioral maintenance factors, a combined CBT/APT approach seemed appropriate. CBT has documented efficacy for treatment of late life anxiety in medically healthy older adults (e.g., Mohlman et al., 2003; Stanley et al., 2003; Wetherell, Gatz, & Craske, 2003) and also appears to be beneficial to those with anxiety and PD (Feeney et al., 2005). Although he did not exhibit dramatic deficits in ESs and would be considered in the normal range of cognitive functioning,

PD is a degenerative disease and Mr. R. may already have been experiencing a gradual decline in ESs that would progressively worsen over time. Additionally, some degree of cognitive decline is also expected in normal aging, in the absence of neurodegenerative disease (Dennis & Cabeza, 2008). Because poor ESs is known to be associated with reduced quality of life and maladaptive symptom perceptions in PD, and to predict nonresponse to CBT, we hypothesized that APT might lead to benefits, and that it would not pose increased risk, to the patient. Given the dearth of research in this area, however, we elicited feedback from Mr. R. throughout the course of treatment, and proceeded in the spirit of experimentation.

7. Course of Treatment and Assessment of Progress

After completing the one-month baseline period during which no treatment was administered, Mr. R. began the active treatment phase. He attended ten total treatment sessions; the first five were 90-to-120 minute sessions of CBT for GAD. The manualized, evidence based treatment included techniques to address the physiological, cognitive, and behavioral aspects of negative moods, anxiety in particular. Mr. R. attended and fully participated in all sessions. He displayed diligence and insight with mood monitoring and identification of distorted thoughts. According to his completed log sheets, he consistently practiced relaxation and successfully utilized deep breathing to lessen tension during stressful periods. He was also encouraged to record his homework on a tape recorder, should his tremors or other motor symptoms make written homework completion too difficult. He completed 10/10 homework assignments, with an average quality rating of 2.3 on a 0-to-3 scale, indicating that all were ‘good’ to ‘very good’ in quality.

Mr. R. learned to use diaphragmatic breathing and progressive muscle relaxation to alleviate some of his physical symptoms (e.g., tension, feeling “keyed up”) and insomnia, especially when the techniques were used in the evening. During the CBT sessions, Mr. R. learned that his physical symptoms are intimately linked with his anxious thinking and behaviors. Mr. R. was able to identify a thought pattern characterized primarily by catastrophizing, rumination and unproductive worrying (especially related to his wife not loving him and potentially leaving him; Burns, 2000). He and his wife observed that when he was able to consistently modify distorted negative thoughts, he felt more in control of his PD-related symptoms and his “off” periods were less frequent and intense.

Additionally, Mr. R. recognized that due to anxiety, he tended to avoid tasks (e.g., list-making, procrastinating) rather than just “getting them done.” Mr. R. also avoided playing guitar because he feared that he would not play well enough. He stopped exercising for fear of “having a heart attack.” Thus, one goal was to break down avoided activities into small, manageable tasks and to gradually expose him to each step until he reported a low level of anxiety. In addition to resuming playing the guitar, Mr. R.’s behavioral goals were to evict a non-paying tenant, gradually reintroduce walking for exercise, and re-establish his relationship with his sons. Mr. R. made substantial progress on all three of these goals—he was ultimately able to confront and evict the tenant, he began walking regularly and he was in regular contact with his sons which included minimal conflict.

Subsequent to the CBT sessions, Mr. R. completed five sessions of APT. These sessions focused on enhancing four types of attention: sustained, selective, divided and alternating, and improving logical reasoning skills. As with the CBT portion, Mr. R. attended and fully participated in all sessions, and worked hard to improve, particularly in the areas in which he felt he had a deficit (particularly in alternating attention and divided attention). His self-rated average level of progress across all sessions was “good,” according to his completed log sheets.

Clinical Outcome

Mr. R. was free of GAD on the post-treatment SCID (administered by phone). Mr. R. showed a considerable reduction in scores on all anxiety measures (Ham-A, PSWQ, STAI, BAI) from pre- to posttreatment. The ‘responder’ criteria (Himadi, Boyce, & Barlow, 1986), defined a priori based on past studies of late life GAD (Mohlman, 2004), required at least 20% reduction on at least 3 measures; as such, Mr. R. was classified as a responder despite the presence of some residual symptoms. Further, Mr. R. showed reductions in symptoms of depression (Ham-D, BDI), which were not the primary focus of the intervention. Scores on psychiatric measures are displayed in Table 2.

Assessing outcome on the neuropsychological tests was somewhat more complicated. Although it is preferable to have a stable baseline (i.e., a period during which time scores remain unchanged across a treatment-free phase), neuropsychological performance of adults is known to fluctuate (Basso, Bornstein, & Lang, 1999). Sources of score change include practice effects, regression to the mean, characteristics of the test taker, elements of the environment, degree of rapport with the tester, and temporary aspects such as attentional lapses and memory retrieval failure (McCaffrey & Westerveldt, 1995). DRT is also associated with ESs score fluctuations in either direction (Cools et al., 2002; Pascual-Sedano et al., 2008), perhaps due to the “inverted-U” pattern of D₁ receptor dose-response sensitivity in the prefrontal cortex (Goldman-Rakic, Muly, & Williams, 2000). As displayed in table 3, a subset of Mr. R.’s scores showed score changes from Baseline 1 to Baseline 2, and the direction of change was variable. The absence of a stable baseline precludes the clear interpretation of performance; however, for the sake of this case we will interpret change from the second baseline set of scores to the midpoint of the intervention and the posttreatment scores to minimize practice effects and other potentially obfuscating factors (e.g., regression to the mean). Thus, in examining the change from baseline 2 to posttreatment, Mr. R. showed some slight improvement in areas in which he performed at the normal level of functioning prior to the cognitive rehabilitation intervention, all of which were nonlinguistic ESs tasks (Digits Backward, Trailmaking B, Digit Symbol). For those tests on which Mr. R. did very well prior to treatment, he did not appear to improve, perhaps due to a ceiling effect (Digits Forward, COWAT, Similarities). His scores on a self report measure of perceived control over mental abilities suggested improvement, however.

Mr. R.’s daily ratings of average anxiety, maximum anxiety, and attentional control were plotted and appear in Figure 1. Across the 14 weeks of the intervention, Mr. R.’s levels of anxiety showed only slight improvement, and his attentional control ratings improved by approximately two points overall, indicating “moderate” attentional control at the onset of treatment and “very good” control of attentional focus following CBT/APT. However, the pattern of ratings suggests that most of the improvement on attentional control took place during the baseline period, and this information was in accordance with the objective neuropsychological measures of outcome.

It is interesting to note that Mr. R.’s reports of symptom severity diverged considerably from the picture provided by more structured, objective measures. For instance, his daily anxiety ratings showed little variance throughout treatment, despite the substantial reductions evident on clinician-rated and self-report measures. Even more pronounced were the discrepancies between Mr. R.’s self-evaluation of and actual levels of cognitive functioning. Mr. R. entered the program with complaints about memory, concentration, critical thinking, and verbal abilities, which he regarded as serious and distressing. However, in Mr. R.’s case, objective cognitive testing revealed no signs of impairment in these areas. Taken together, these observations suggest Mr. R. perceives (or reports) his level of functional impairment as considerably worse than it actually is. Studies suggest that a subset of patients with PD exhibit poor self-awareness and a self-concept lacking in complexity, and that these difficulties may

be linked to frontal lobe dysfunction (McNamara, Durso, & Harris, 2006). Research also indicates that many patients with PD show a pattern of low perceived control and self-efficacy (McQuinlan, Licht, & Licht, 2003) and lower outcome expectancies for future self, even when compared to other populations with neurodegenerative diseases (Frazier, Cotrell, & Hooker, 2003). These processes are thought to contribute to greater psychological distress and poorer overall adjustment.

In summary, the intervention led to an improvement in anxiety that was more apparent on self-report and clinician-rated instruments than daily ratings of mood. There was no change on neuropsychological test performance; however, the self report measure of attentional control indicated gains.

8. Complicating Factors

In treating this patient, a number of PD and non-PD related symptoms emerged as obstacles to the implementation of this intervention. One of major obstacles is conducting sessions during this patient's "off periods." Changes in mood and anxiety usually coincide with changes in motor function, such that when the patient is off, they are more anxious and more depressed. Furthermore, there appears to be a relationship between anxiety and the clinical symptoms of PD in that anxiety is associated with a transient increase in tremor and motor dysfunction (Menza & Dobkin, 2006).

A large part of both phases of this intervention involved written self-monitoring (log sheets were used throughout the program to monitor daily mood, practice of APT skills, etc.). It was found that conducting sessions while Mr. R. was during his "off periods" was challenging, as the increased tremors impacted his ability to write. Mr. R. reported that his problems with writing were often caused by rigidity, tremors and lack of coordination associated with PD. Mr. R. also reported ongoing trouble with micrographia, in which handwriting starts out of normal size but progressively decreases until illegible. Although Mr. R. was encouraged to use audio taping devices on these assignments, he opted to write instead. In some cases, his difficulties in writing made it difficult to complete thought records, which is an essential component of CBT. This "off period" also seemed to affect Mr. R.'s cognitive abilities in that his concentration noticeably worsened and he seemed to have more difficulty grasping the materials presented during the sessions. Dysarthria, a speech disorder that is a common manifestation of PD, also became more noticeable. This includes monotony in pitch and volume, imprecise articulation, variations in speed resulting in both inappropriate silences and rushes of speech. Ability to communicate was therefore impacted during these "off periods" because Mr. R.'s voice became softer and the content of his speech was harder to comprehend.

In addition to motor symptoms associated with PD, Mr. R. also suffered from chronic back pain, which significantly limited his mobility. Often times Mr. R. used a walker and wore a back brace to sessions. His lack of mobility was a limiting factor to certain aspects of the treatment program. Moreover, Mr. R. was reluctant to attempt certain exposure exercises (e.g., playing guitar, walking) as he was concerned that his difficulties in mobility would interfere or that the activity would exacerbate the pain.

One factor that helped to mitigate these challenges was the assistance of Mr. R.'s wife, who provided physical and emotional support for Mr. R. throughout the program. She accompanied Mr. R. to every session, as Mr. R. is no longer able to drive. Furthermore, Mrs. R. was invited to actively participate in one of the CBT sessions in which she assisted Mr. R. in challenging his toxic thoughts, which she was asked to continue doing at home. She was therefore essential to Mr. R.'s success in this program.

9. Follow up

The Ham-A was administered by phone one and three months following termination of treatment (see table 2). In the final phone check-in, Mr. R. reported that participating in CBT/APT had been very helpful for him, and that he has been better able to manage his anxiety since completing the program. He still experienced increased control over PD-related symptoms when he toned down negative thoughts. Mr. R. reported considerable gains in both mood and attentional control, which were corroborated by his wife. He also reported that he had successfully reestablished relationships with both of his sons. Mr. R. reported that he had recently been told conclusively by his physician that he did not have any serious heart problems. Both of these life events also had a positive impact on his mood.

10. Treatment Implications of the Case

CBT/APT was feasible and readily accepted by the client. He was engaged in all exercises and completed most of the homework. The complicating factors described earlier did not appear to compromise the overall efficacy of CBT in any appreciable way. Anxiety symptoms from baseline 1 to baseline 2 were mostly stable, indicating that reductions in anxiety seen at posttreatment are indeed meaningful. Current results add to the slowly growing literature on the efficacy of CBT for treating nonmotoric symptoms of PD (Dobkin et al., 2006; Dreisig et al., 1999; Feeney et al., 2005). This is one of the first PD cases treated with individual, as opposed to group CBT for anxiety, which did not seem to reduce its efficacy in any detectable manner. Treatment was delivered in just five 90-to-120 minute sessions, which is considerably shorter than that of prior studies using a greater number (i.e., 12 to 14) of 50 to 60 minute sessions (e.g., Dobkin et al., 2006). Thus, as also demonstrated in Dreisig et al. (1999), the therapy can be administered in a short period of time.

The APT component did not appear to lead to substantive benefits, which was somewhat surprising. Efficacy of cognitive rehabilitation in PD has not been widely studied. In fact, we found just one published paper on the use of behavioral strategies for improving cognitive functions. Sinforiani et al. (2004) used a neuropsychological training software program with twenty patients with PD, who completed twelve 60 minute sessions of cognitive training over six weeks' time. In each session, attention, reasoning, and visuospatial tasks were practiced at different levels of complexity. Participants showed significant improvement on three out of ten tests at posttreatment and six-month follow up as compared to baseline. The remainder of scores were unchanged. Although such level of gain may seem negligible, it has been suggested that a lack of skill loss over time is in and of itself an improvement in certain clinical groups (Troster et al., 2007). Given that PD is a progressive disorder of the brain, Mr. R.'s outcome might then be regarded more positively than if he were neurologically healthy, as he did not show any meaningful score reductions.

11. Recommendations to Clinicians and Students

Based on this case, we recommend the use of CBT for treating anxiety in PD patients. The therapy is feasible, and has a growing body of research to support its efficacy in this particular population of older adults. Although benefits of the APT component were less apparent, we argue that APT should be tested in a larger sample before being deemed ineffective. This is because Mr. R. did not present with the typical profile of ESs deficits so often seen in PD. Rather, he scored very well on several tests, which might have led to ceiling effects on the outcome battery, or a different pattern of change than what is seen in those with reduced ESs.

We can, however, comment on minor changes that could be made to both CBT and APT to make them easier to use with PD patients. Because activities of CBT (especially homework assignments) rely on written work and the patient had intermittent trouble adhering to the

writing assignments, we posit the use of recording devices or therapist assistance with writing as an alternative. And although we offered just one session that included the caretaker as an active participant, some protocols invite the caretaker to a larger number of sessions, also with positive results. This may need to be decided on a case-by-case basis, taking the patient's preference into consideration. We also noted benefits from stressing the relation between negative thoughts and the perception of control over symptoms attributed to either PD itself, or to the fluctuations brought about by the patient's medication schedule. We also recommend making every effort to schedule sessions around patients' "off" periods, given the additional functional difficulties that are apparent during the "off" phase of the medication cycle.

The APT practice was meant to be rigorous and challenging but not unpleasant, and although this goal was met, we noted that Mr. R. rated his level of enjoyment of the training as lower than what was intended. This information was then applied toward revising the practice to include intermittent rewards (e.g., healthy snacks or beverages, brief shoulder massage from caretaker, unseen photos of client's pets or family members provided by spouse) and a longer rest period (> 5 min) for future PD patients in our treatment program.

In summary, the CBT/APT intervention was feasible, beneficial, and reasonably enjoyable. Mr. R. and his wife reported an increase in quality of life during the follow-up period. The intervention was relatively brief, easy to administer, and because both components are standardized and manualized, would be portable to locations other than a mental health clinic. Overall, the treatment team and patient were pleased with the outcome. Because the global aging trend will continue, and our knowledge of the optimal interventions for PD is still in its infancy, we hope that a growing number of mental health researchers and practitioners will contribute to the serious but underrecognized problem of treating psychiatric symptoms in PD.

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Figure 1.
Daily mood ratings during baseline (week 1 to 4) and treatment phases (week 5 to 14).

Table 1

Summary of the 10-Session CBT/APT Intervention

	Goals	Intervention	Homework
Session 1-CBT	<ul style="list-style-type: none"> -Learn the three-part model of emotion -Focus on the physiological component of anxiety 	<ul style="list-style-type: none"> -Diaphragmatic breathing -Progressive muscle relaxation (PMR) 	<ul style="list-style-type: none"> -Diaphragmatic breathing and PMR -Daily mood record
Session 2-CBT	<ul style="list-style-type: none"> -Learn cognitive restructuring module 	<ul style="list-style-type: none"> -Identify cognitive distortions -Cognitive Restructuring. 	<ul style="list-style-type: none"> -Identify cognitive distortions -Thought record -Daily mood record
Session 3- CBT	<ul style="list-style-type: none"> -Complete cognitive restructuring module -Introduce behavioral component of anxiety module 	<ul style="list-style-type: none"> -Cognitive restructuring with perspective taking -Reverse avoidance behaviors 	<ul style="list-style-type: none"> -Cognitive restructuring with perspective taking -Task hierarchy -Daily mood record
Session 4- CBT	<ul style="list-style-type: none"> -Complete behavioral component of anxiety module 	<ul style="list-style-type: none"> -Exposure to anxiety provoking situations -Worry behavior log -Act "as if" 	<ul style="list-style-type: none"> -Task hierarchy -Worry behavior log -Daily mood record
Session 5- CBT	<ul style="list-style-type: none"> -Review three part model of anxiety -Consolidate newly acquired skills -Sleep hygiene 	<ul style="list-style-type: none"> -Review diaphragmatic breathing, PMR, all other CBT skills. 	<ul style="list-style-type: none"> -Daily mood record
Break			
Session 6- APT	<ul style="list-style-type: none"> -Improve sustained attention 	<ul style="list-style-type: none"> -Practice sustained attention using APT CDs, Alphabetized sentence, Mental control exercises 	<ul style="list-style-type: none"> -Read lengthy chapter of book, trying to absorb content -Spend one hour cleaning one room in house without break -Play with pet for at least 30 minutes -Complete log sheets -Daily mood record
Session 7- APT	<ul style="list-style-type: none"> -Improve selective attention 	<ul style="list-style-type: none"> -Practice selective attention using APT CDs with recorded and live distraction 	<ul style="list-style-type: none"> -Practice pairing socks as quickly as possible -Locate homes of two friends and a business (such doctor's office) using Google Earth -Develop shopping list that includes specific brands; locate them in unfamiliar market -Complete log sheets -Daily mood record

	Goals	Intervention	Homework
Session 8-APT	Improve divided attention	-Practice multitasking using APT CDs while also completing math or semantic exercises	<ul style="list-style-type: none"> -Talk on phone while writing shopping list -Watch TV while folding laundry, writing note or email -Listen to radio while preparing a meal -Complete log sheets -Daily mood records
Session 9-APT	Improve alternating attention	-Practice alternating attention using APT CDs and Alphabetized sentence exercise using alternating rules	<ul style="list-style-type: none"> -Do math in between cooking steps -Alternate reading and writing -Complete log sheets -Daily mood record
Session 10- APT	Improve Logic	-Practice logical reasoning	-Review and practice all APT skills.

Table 2

Baseline, Pre- and posttest scores on psychiatric measures.

Anxiety and Worry	Baseline 1	Baseline 2 (pretreatment)	Posttreatment
PSWQ	77	74	55
BAI	35	17	22
STAI	68	72	43
Ham-A	36	34	24, 1 month f.u.=19 3 month f.u.=14
Depression			
BDI	26	21	17
Ham-D	25	21	14

Note. PSWQ = Penn State Worry Questionnaire (Meyer et al., 1990); BAI = Beck Anxiety Inventory (Beck & Steer, 1990); STAI = State-Trait Anxiety Inventory (Spielberger et al., 1983); Ham-A = Hamilton Scale for Anxiety (Hamilton, 1959); BDI = Beck Depression Inventory (Beck & Steer, 1987); Ham-D = Hamilton Scale for Depression (Hamilton, 1960).

Table 3

Baseline and pre-posttreatment scores on neuropsychological tests in percentiles.

<i>Cognitive Functioning</i>	Baseline 1	Baseline 2 (pre-treatment)	Post-Treatment
Attentional Control Scale	54	64	71
Mini Mental State	29/30	-	-
Boston Naming Test	86th	-	-
Digits Forward	50th	90th	50th
Digits Backward	50th	25th	95th
COWAT (FAS)	99th	99th	95th
Stroop CW	30th	50th Midpoint = 35th	36th
Similarities	98th	99th	97th
Trailmaking A	86th	87th Midpoint = 86th	80th
Trailmaking B	19th	44th Midpoint = 86th	60th
Digit Symbol	37th	9th	37th

Note. Mini Mental State Exam (Folstein et al., 1975); Boston Naming Test (Kaplan, Goodglass, & Weintraub, 1983); Digit Span, Verbal Paired Associates, Similarities and Digit Symbol (Wechsler, 1997); COWAT (FAS; Benton & Hamsher, 1976); Stroop Task (Trenerry et al., 1989); Trailmaking Test A& B (Army Individual Test Battery, 1944). Percentile interpretation: *Low average range* = 9th – 26th percentile; *Average range* = 27th – 55th percentile; *High average range* = 56th – 63rd percentile; *Superior range* = 64th – 69th percentile; *Very superior range* = 70th and above (Lezak, Howieson, Loring, Hannay, & Fischer, 2004).