INTERNATIONAL JOURNAL OF BEHAVIORAL CONSULTATION AND THERAPY
2013, VOL. 7, NO. 4

ISSN: 1555–7855

Behavioral Relaxation Training for Parkinson's Disease Related Dyskinesia and Comorbid Social Anxiety

Duane A. Lundervold[1,2], Rajesh Pahwa[3], and Kelly E. Lyons[3]
[1]University of Central Missouri, [2]Plaza Primary Care and Geriatrics-Kansas City, Center for Parkinson's Disease and Movement Disorders, and [3]University of Kansas School of Medicine

Abstract

Effects of brief Behavioral Relaxation Training (BRT) on anxiety and dyskinesia of a 57-year-old female, with an 11-year history of Parkinson's disease (PD) and 18-months post-deep brain stimulation of the subthalamic nucleus, were evaluated. Multiple process and outcome measures were used including the Clinical Anxiety Scale (CAS), Subjective Unit of Distress (SUD) rating and Abbreviated Treatment Acceptability Rating Profile (AARP). An A-B single-case research design with a six week follow up was used to the evaluate effectiveness of intervention. BRT resulted in systematic increases in relaxed behavior and decreased SUD ratings in vivo and decrements in CAS scores. Results were maintained at follow up. The participant rated BRT as highly acceptable. Use of single-case research design enabled objective evaluation of intervention effects. Due to the heterogeneity of PD patients, single-case experimental designs are especially valuable for evaluation of treatment effectiveness and technique building with this population. Finally, findings suggest that BRT is a valuable adjuvant behavior therapy intervention for patients with anxiety and dyskinesia related to Parkinson's disease. Further research regarding BRT and Parkinson's disease-related disability are indicated.

Keywords

Behavioral Relaxation Training, Parkinson's disease, dyskinesia, anxiety

Parkinson's disease (PD) is a progressive, neurodegenerative neurological disorder of unknown etiology. Loss of dopaminergic cells in the substantia nigra of the brain is responsible for motor, affective and cognitive changes observed. No cure is available. Common motor symptoms are tremor, rigidity, and bradykinesia, as well as postural instability in later stages of the disease (Weiner, Shulman, & Lang, 2001). As the disease progresses medication induced motor symptoms, such as dyskinesia--involuntary gross motor wiggling or dance-like movement affecting upper and lower extremities--may emerge (Weiner et al, 2001).

Awareness of the importance and impact of nonmotor symptoms has grown with clinical and research experience indicating cognitive and behavioral components substantially contributing to impaired quality of life and increased severity of motor symptoms. Yet, anxiety remains unrecognized and under treated among PD patients. (O'Sullivan, Williams, & Gallagher, 2008; Schulman, Taback, Rabinstein & Weiner, 2002). Anxiety disorders are the most common psychological disorder in the general population (Thyer et al., 1985), while anxiety disorders among older adults often co-occur with medical and neurological disorders (Raj et al., 1993). PD and comorbid anxiety have been documented repeatedly with estimates of 40-75% (Schiffer, et al., 1988; Shulman et al., 2002; Stein, Heuser, Juncos, Uhde, 1990). Clinical treatment, when provided, is primarily pharmacological with anxiolytics, benzodiazepines or antidepressants used. Pathological neurodegenerative changes in noradrenergic mechanisms may be responsible for anxiety experienced by patients with PD (Marsh, 2000). No experimental studies have examined the efficacy of medication in this population.

The effects of anxiety on functioning of PD are formidable and further diminish quality of life (Marinus, Leentjens, Visser, Striggelbout & Van Hilten, 2002). Comorbid anxiety results in increased motor dysfunction including more severe tremor, "freezing" (sudden inability to move), dyskinesia and situational anxiety. Indeed, anxiety may produce excess disability than that observed solely due to PD. Treatment of motor and non motor symptoms of PD focuses on maintaining and improving quality of life. Addressing comorbid anxiety is an important target in this process and relaxation training has been suggested (Marsh, 2000).

Despite the wide spread occurrence of comorbid anxiety and PD, few reports of relaxation training with PD patients are available. Schumaker (1980) examined the effect of frontal electromyographic (EMG) biofeedback and progressive muscle relaxation training on manual motor performance of PD patients. No effect of intervention on motor performance was observed. Behavioral Relaxation Training (BRT) has been used to successfully manage tremor of two older adults; one with essential tremor (ET) and another with ET and PD (Chung et al., 1995). Chung et al reported decreased tremor severity and improved performance in activities of daily. Improved psychological adjustment was anecdotally reported. Lundervold (1997) reported that BRT and coping self-instructions were effective with an ET patient in reducing tremor severity related to negative arousal (anger in specific social situations). Decreased emotional distress and EMG activity among four muscle groups was observed. More recently, Lundervold, Pahwa and Lyons (2009) reported using behavioral intervention that included BRT for management of PD and comorbid general anxiety.

Two contemporary behavioral accounts describe anxiety and distress among movement disorder patients (Lundervold & Poppen, 2004; Macht & Ellgring, 1998). These reports describe a three component behavioral model. From a behavioral perspective, identification of current maintaining contextual variables, (i.e., setting events, antecedents and consequences) is critical in selection appropriate interventions (Speigler & Guevremont, 2003). Biological change, such as altered neurological substrates, serves as contextual setting events that will affect subsequent stimulus-response relations. For example, altered neurological connections in Parkinson's disease produce increased autonomic arousal and anxiety. Similarly, performance of certain motor behaviors may not be possible due to degeneration of dopaminergic cells necessary for effective agonist-antagonist action of muscles such as tensing and relaxing muscles as is required in progressive relaxation. Disordered movement--such as "freezing" or dyskinesia--may be aversive and function as unconditioned stimuli (US) that elicit unconditioned (emotional) responses (UR). Previously neutral stimuli (conditioned stimuli, CS) paired with aversive PD symptoms acquire the eliciting properties of the US. When the CS occurs, a conditioned emotional response (CER, anxiety) is elicited. Verbal behavior, may also be conditioned based on respondent and operant principles of behavior (Hayes, 1989; Davey, 1997; Skinner, 1957). When an aversive US is presented a negative verbal evaluative response may be elicited (e.g., "This dyskinesia is terrible! What will people think?") in conjunction with unconditioned visceral, motor, and observational responses. Verbal behavior also may have operant functions of a discriminative stimulus and set the occasion and guide its occurrence, for example, "I need to stay away from people." As an establishing operation (EO), verbal behavior affects the relative strength of consequences influencing fearful behavior (Malott, 1989). In this case, consequences for avoiding/escaping from social situations that have been paired with dyskinesia are strengthened. As before, assessing and discriminating the function of verbal behavior will aid in appropriate and effective intervention. If the verbal behavior serves a primary function as an EO, behavioral interventions aimed to lessen the effectiveness of the EO would be appropriate, for example, engaging in approach behavior in the context of low intensity feared stimuli or employing a competing behavior model of intervention. A functional behavior analysis allows pinpointing of current maintaining overt and covert environmental conditions leading a greater likelihood of prescriptive treatment rather than simply implementing an intervention based on the structure of the behavior.

Behavioral Relaxation Training (BRT), a behavior analytically-based procedure, employs behavioral skill training to teach 10 overt relaxed behaviors (Poppen, 1998). The behaviors are Head, Eyes, Mouth, Shoulders, Throat, Body, Hands, Feet, Quiet and Breathing. Motor response definitions have been empirically validated (Poppen & Maurer, 1983). Training of the behaviors proceeds through

Table 1. Participant characteristics.

		UPDRS[2,3]					
		ADL		Motor			
PD duration[1]	Mentation	On meds	Off meds	On meds	Off meds	PD staging[4]	Medication
11 years[2]	mild confusion intermittent depression	6	7	14	19	H/Y III/V	MVI qd Prevacid 15 mg qd Colace one qd Amantadine 100 mg tid Artane 2 mg tid Lexapro 10 mg qd Sinemet 25/100 ½ 5x/day Ambien 5 mg qghs prn Fosamax 1 q week

[1] based on time since diagnosis
[2] UPDRS assessment conducted with stimulation (Fahn et al., 1987)
[3] UPDRS with stimulation at the time of behavior therapy
[4] Hoehn & Yahr (1967) disease severity staging

two phases: acquisition and proficiency. During acquisition training participants acquire the 10 overt behaviors. Whereas in proficiency training the goal is fluent performance of overt behavior and instruction in covert observation and discrimination of interoceptive, proprioceptive, kinesthetic stimuli produced by performance of overt relaxed or unrelaxed behavior. Verbal instructions are provided to prompt accurate discrimination of covert stimuli, for example, "Notice what it feels like as you relax your hand in the curled, claw-like position on the arm of the chair." Correct performance of relaxed behaviors is reinforced using praise. Corrective feedback is provided contingent on unrelaxed behavior. As a result, "the problem of privacy" with respect to correspondence between private and public behavior is lessened since participant's verbal report of relaxation states is more likely to correspond with performance of overt relaxed behavior (Skinner, 1969).

Typically, eight to 15 BRT individual BRT sessions are conducted with training in both reclined and upright relaxed positions (Chung, Poppen, & Lundervold, 1995; Lundervold & Poppen 2004). Because BRT is based on performance of overt behavior it is easier to teach to children and disabled individuals who may not have the capacity or skill to covertly observe and report on change in muscle tension as is the case when using progressive muscle relaxation. Similarly, BRT for individuals with motor impairment, such as PD, may be especially valuable where the disease diminishes capacity to tense and relax skeletal muscles.

Participant

RZ (a fictitious name), a cognitively intact 57-year-old female with PD 18 months post-DBS implant surgery of the sub thalamic nucleus, took part. RZ met DSM-IV-TR criteria for Social Anxiety and reported no pre-morbid history of anxiety disorder. She was stabilized on anti-Parkinson and anxyiolytic medication for six months prior to referral. Anxiety was related to moderate to severe lower right extremity dyskinesia remained problematic. Abnormal motor movement was provoked by social situations and stress, e.g., driving in traffic. RZ had no previous history of anxiety and pre-DBS surgery psychological assessment indicated no premorbid psychopathology.

The Unified Parkinson's Disease Rating Scale (UPDRS) is a widely used clinical and research instrument used to assess motor performance, activities of daily living (ADL), behavior and mentation (cognition and mood) (Fahn et al., 1987). (See Table 1).

UPDRS assessment, conducted one day after initial contact for behavior therapy services, evaluated performance of ADLs, motor skill and mentation (cognition and mood) (Fahn et al., 1987). Post-DBS UPDRS assessment revealed significant functional improvement and mild to minimal dyskinesia.

Measures

The Clinical Anxiety Scale (CAS, a 25-item structured self-report rating scale was used for idiographic assessment of anxiety (Thyer, 1984). Reliability and validity of the CAS is good. A benefit of the CAS is its description of overt behaviors and situations related to anxiety rather than an emphasis on physiological and neurophysiological items that mimic PD (Higgins, Fields, Troster, 2001). Clinical cut off is 30 (range of 0-100) with higher scores indicating greater severity.

Depression was measured using the Geriatric Depression Scale (GDS). The 30-item, full scale GDS was used to assess self-reported depression (Yesavage, Brink, Rose, Lum, Huang, Adey, & Leier, 1983). The GDS has been recommended for use with medically ill and PD patients (Meara, Mitchelmore, & Hobson, 1999). Clinical cut off is 11 with higher scores indicating greater self-reported depression. SUD ratings (subjective unit of distress (SUD) were obtained using a 0-10 SUD (1 = calm; 10 = panic) scale to record episodic distress associated with social situations and dyskinesia (Wolpe & Lazarus, 1966).

The Behavioral Relaxation Scale (BRS), a valid, quantitative, direct observation measure of 10 relaxed behaviors (Poppen, 1998) was used to assess relaxation. Each minute of the observation period is divided into three intervals of 30-, 15-, and 15- seconds. During the 30-second interval, the number of breaths is counted. In the first 15-second interval the remaining nine behaviors are observed. In the subsequent 15-second interval, the behaviors are scored as relaxed or unrelaxed. A percent-relaxed score is obtained by dividing the number of relaxed behaviors by the total number of relaxed and unrelaxed behaviors x 100.

The eight-item Abbreviated Acceptability Rating Profile (AARP) was used to assess acceptability of behavior therapy intervention (Tarnowski & Simonian, 1992). The AARP has a unitary factor structure (acceptability) and has been found to have good reliability when used with clinical samples. Scores can range from 8-48 with higher scores indicating greater acceptability.

Procedure

All contact with the patient was conducted in a standard medical examination room contained in a movement disorders center. Five treatment sessions, scheduled two to four weeks apart, were conducted. A sixth and final session was conducted six weeks post-treatment and served as a follow up assessment.

A. Baseline. At session one, the Clinical Anxiety Scale (CAS) and Geriatric Depression Scale (GDS) were completed, followed by a diagnostic and behavioral interview (DAL). The purpose of the behavioral interview was to pinpoint intervention goals, target behaviors, and current maintaining antecedent and consequent conditions related to social anxiety and dyskinesia (Speigler & Guevremont, 2003). After providing a rationale for self-recording, the patient was trained in the use of SUD recording. Review of anxiety and dyskinesia over the preceding 24-hour period was conducted, situational antecedents were identified and a Subjective Unit of Distress (SUD) rating made for each.

B. BRT. Four sessions of BRT were conducted. Due to the limited time available for intervention, baseline assessment of relaxed behaviors was not conducted. Self-report measures were completed at the beginning of each session. Each BRT sessions was approximately 15-minutes in duration. At the end of each BRT training session, a two- to five-minute post-training as-

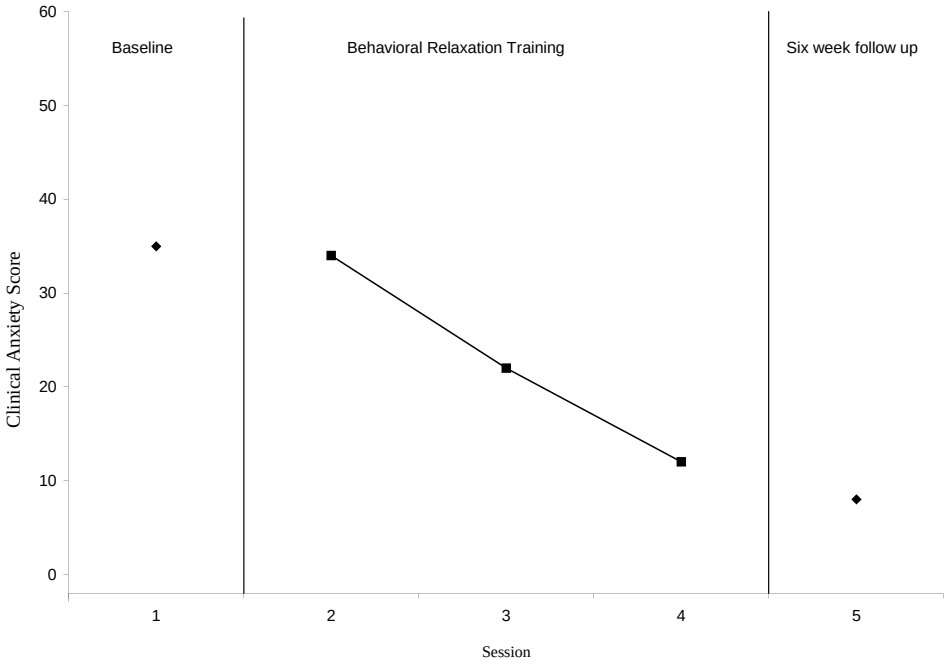

Figure 1. CAS score during baseline, BRT and follow up

sessment of relaxed behavior was conducted using the Behavioral Relaxation Scale (BRS). The relaxed behaviors were trained while the patient was seated in the upright position of a straight back chair. Praise and corrective feedback were provided. The patient was instructed to practice BRT at least once per day, and to use BRT prior to encountering anxiety provoking situations and to engage in the relaxed behaviors when experiencing anxiety or dyskinesia. Homework included recording situations the evoked anxiety or dyskinesia and to make SUD ratings during episodes of anxiety. SUD ratings were to be recorded at the on-set of the anxiety immediately before and after using BRT. The patient was instructed to continue engaging in the relaxed behaviors until the SUD rating declined from its previous level. Patient diary data (SUD ratings) were mailed or brought to the next treatment session depending on the point in treatment. A treatment acceptability rating was obtained at the last treatment session.

C. Follow-up assessment. A six week follow up assessment, was conducted at which time self-report measures were completed and direct observation of relaxed behavior was obtained.

Results

BRS scores indicated increasing skill in demonstrating relaxed behavior following BRT. Session-by-session BRS scores were: 70%, 78%, 95% and 74% relaxed at follow up. Baseline CAS score indicated mild, clinically significant anxiety (Thyer, 1984). (See Figure 1).

CAS scores systematically declined following BRT. Results were maintained at follow up. Substantial subjective distress was reported at baseline. (See Figure 2).

In vivo BRT produced systematic decreases in pre- to post-BRT SUD ratings. Over the course of treatment and follow-up period, pre-BRT SUD ratings demonstrated an increasing and deteriorating trend. Nonetheless, following BRT distress was substantially reduced. Despite higher pre-BRT SUD ratings at follow-up, in vivo BRT resulted in the lowest post-BRT SUD ratings recorded. GDS scores declined during BRT with low levels of self-reported depression maintained at follow up. BRT for managing social anxiety and dyskinesia was rated as extremely acceptable (46/48).

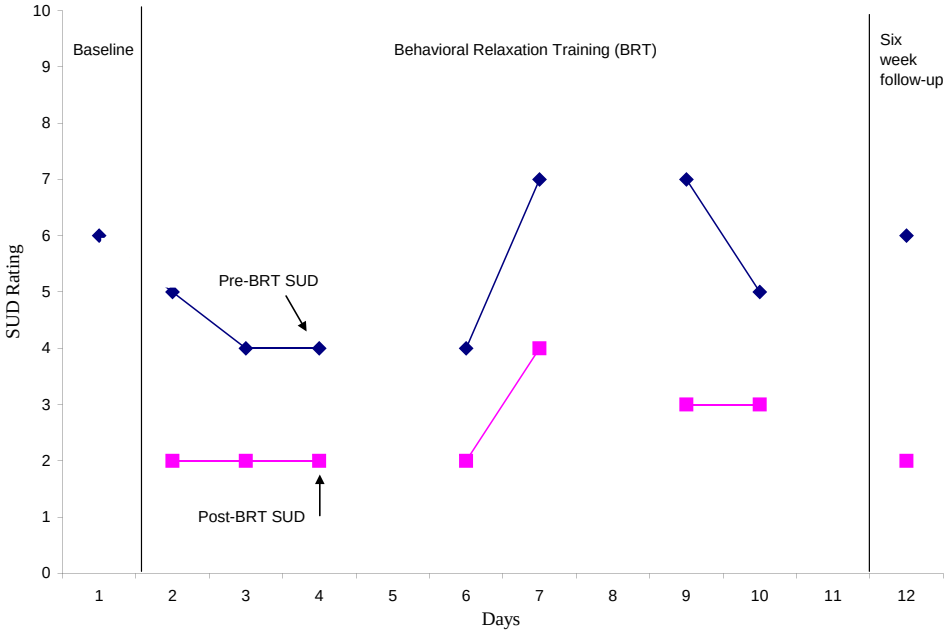

Figure 2. Pre-post SUD ratings during baseline, BRT and follow up

Discussion

Brief BRT resulted in increased skill in performance of relaxed behaviors, reduced emotional distress in vivo, management of dyskinetic episodes and clinically significant change in structured self-report questionnaire measure of anxiety. BRT also was found to be highly acceptable to the patient. Effects of BRT on anxiety were above those produced by medication or DBS implant surgery. Use of single-case research methods enabled objective evaluation of the benefit of and magnitude of change following intervention (Bloom, Fischer, & Orme, 2003).

Results add further support to the use of BRT for management of anxiety and dyskinesia associated with PD (Chung et al., 1995; Lundervold, Pahwa, & Lyons, 2009). While relaxation has been advocated by physicians working with PD patients (Marsh, 2000), only two other reports of are available in the literature (Chung et al., 1995; Schumaker, 1980). Our results are consistent with Chung et al and contradict Schumaker. Unlike progressive muscle relaxation, as employed by Schumaker, BRT does not require the participant to engage in a series of tense-relax exercises. Lack of benefit reported by Shumaker may have been due to the setting event affecting the participants, i.e., diminished biological capacity to perform the necessary response. Consequently, BRT may be the relaxation training procedure of choice for patients with PD who experience loss of motor control and heightened muscle tonus. Further research, comparing BRT with other relaxation training procedures for PD, is indicated.

Obvious limitations of this case study include retrospective and limited baseline SUD rating, lack of baseline assessment and reliability of relaxed behavior, and limited follow-up assessment. Dyskinesia was not directly assessed though the patient reported a decrease in dyskinesia following BRT. Clearly, further examination of the effect of BRT on dyskinesia and social anxiety among PD patients I needed using more rigorous single-subject research

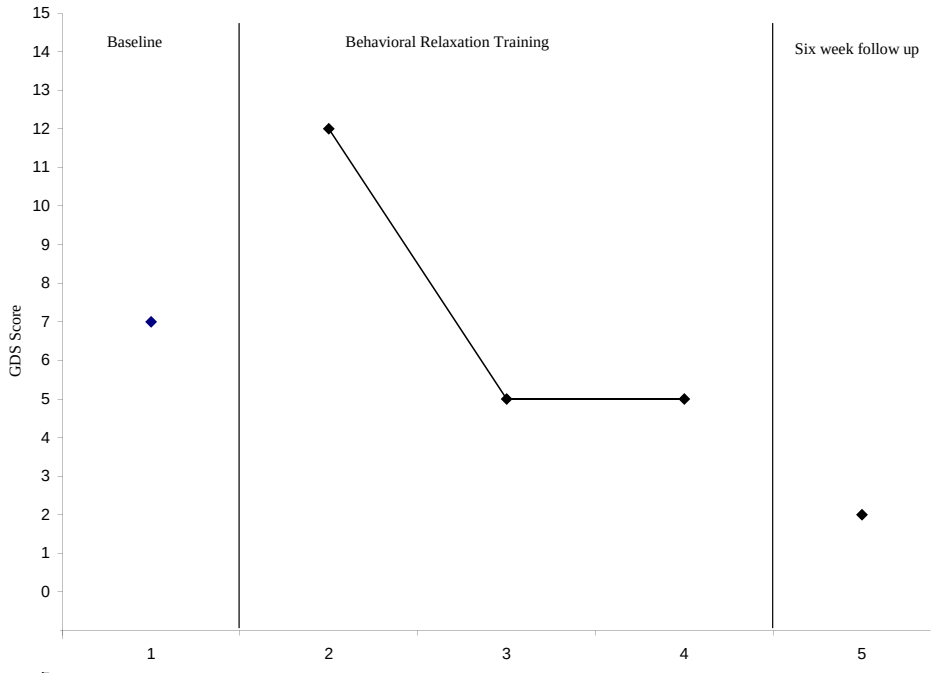

Figure 3. GDS score during baseline, BRT and follow up.

designs. Application of more rigorous single-subject research designs will be challenged as clinicians must contend with intermittent treatment episodes. Nonetheless, use of multiple measures of treatment outcome and process, and pre-treatment chronicity of the behavior, lend support to the conclusion that BRT was responsible for the decreased anxiety and dyskinesia. BRS data were collected using brief observation periods ranging from two- to five- minutes in duration. This is atypical compared to past research on BRT (Poppen, 1998). Poppen suggested that results of observation intervals of three-and five minutes were substantially equivalent. He also recommended that in clinical situations a single 15-minute baseline observation be conducted. Given the exigencies of assessment and intervention in medical settings, current reimbursement practices, and the need to provide rapid evidenced-based treatment, it is unclear if such a standard can be met. Use of valid, brief BRS observation procedures would be valuable in this context. Further research is needed examining the relation between short and long duration BRS observation periods, e.g., 1-, 3-, and 5-minute periods. Our preliminary research suggests that there is a strong positive association between 3-minute, medium duration BRS intervals and BRS scores based on 5-minute observation periods (Lundervold & Dunlap, 2005). Consequently, objective, reliable and valid measures of relaxed behavior using direct observation methods are feasible in practice settings and are strongly recommended.

Anxiety is a frequent comorbid disorder that accompanies PD, though unfortunately it is misdiagnosed, undiagnosed or considered an autonomic nervous system (ANS) of PD itself. When clinicians encounter patients with PD, great care should be under taken to assess and treat anxiety, even though the level of distress does not meet diagnostic criteria. Clinicians should also be aware the behavior change may accompany DBS surgery.

Due to the relation between ANS arousal and impaired movement, skills in regulating arousal provide patients with improved quality of life. In this regard SUD ratings provide clinicians with an easy and effective means to assess subjective distress over the course of treatment. As relaxation has been recommended as a treatment for comorbid anxiety and PD, clinicians would benefit from training in relaxation training procedures, such as BRT, that can be used by patients with movement disorders. Unlike other relaxation training procedures that require tense-release motor exercises or generation of images, BRT requires patients to engage in 10 overt relaxed behaviors. These behaviors can be easily and taught and can be used with individuals with cognitive impairment, as is often the case with PD. Because directly observable behaviors are defined and trained, a behavioral checklist can be used with caregivers to prompt home practice of relaxed behavior and increase the likelihood of transfer of training to the natural environment. Finally, direct observation of relaxed behaviors using the Behavioral Relaxation Scale (BRS) provides both clinician and patient with clear evidence of success. For clinicians, the BRS provides objective data which serves a feedback function allowing data-based change in intervention.

References

Bloom, M., Fischer, J., & Orme, J.G. (2009). *Evaluating practice. Guidelines for the accountable professional* (6th Ed.). Boston: Pearson.

Chung, W., Poppen, R., & Lundervold, D.A. (1995). Behavioral relaxation training for tremor disorders. *Biofeedback and Self-Regulation*

Davey, G.C.L. (1997). A conditioning model of phobia. In G.C.L. Davey (Ed.), *Phobias: A handbook of theory, research and treatment.* (pp.301-322).

Fahn, S., Elton, R., & Members of the UPDRS Development Committee. (1987). In Fahn, S., C.D. Marsden, P.B., Calne, & M. Goldstein (Eds.), *Recent developments in Parkinson's disease*, *Vol. 2*, pp. 156-163.

Hayes, S.C. (1989). *Rule governed behavior: Contingencies, cognition, and instructional control.* NY: Plenum.

Higgins, C.I., Fields, J.A., Troster, A. (2001). Which symptoms of anxiety diminish after surgical interventions for Parkinson's disease? *Neuropsychiatry, Neuropsychology, and Behavioral Neurology*, *14,* 117-121.

Hohn, M.M. & Yahr, M.D., (1967). Parkinsonism: Onset, progression, and mortality. *Neurology*, *17*, 427-442.

Lundervold, D.A. (1997). Behavioral medicine interventions for older
adults coping with essential tremor and related disabilities. *Directions in rehabilitation counseling*, *3*, 3-12.

Lundervold, D.A. & Dunlap, A. (2006). Alternate forms reliability assessment of the Behavioral Relaxation Scale: Preliminary results. *International Journal of Behavioral Consultation and Therapy*, 2, 240-245.

Lundervold, D.A., Pahwa, R., & Lyons, K.E. (2009). Effect of behavioral intervention on
comorbid anxiety and Parkinson's disease. *Clinical Gerontologist, 32*, 104-117.

Lundervold, D.A. & Poppen, R. (2004). Essential tremor and disability: A bio behavioral conditioning model of tremor. *Clinical Gerontologist*, 27, 31-40

Macht, M. & Ellgring, H. (1999). Behavioral analysis of the freezing phenomenon in Parkinson's disease: A case study. *Journal of Behavior Therapy and Experimental Psychiatry*, *30*, 241-247.

Malott, R.W. (1989). The achievement of evasive goals: Control by rules describing contingencies that are not direct acting. In S.C. Hayes (Ed.), *Rule governed behavior: Cognition, contingencies and instructional control* (pp. 269-324). NY: Plenum.

Marinus, J., Leentjens, A.F., Visser, M., Striggelbout, A.M., & Van Hilten, J.J. (2002). Evaluation of the hospital anxiety and depression scale in patients with Parkinson's disease. *Clinical and Neuropharmacology, 25, 318-24.*

Marsh, L. (2000). Anxiety disorders in Parkinson's disease. *International Review of Psychiatry*,*12*, 307-318.

Meara, J., Mitchelmore, E., & Hobson, D. (1999). Use of the GDS-15 geriatric depression scale as a screening instrument for depression symptomology in patients with Parkinson's disease and carers in the community. *Age and Ageing, 28*, 35-38.

O'Sullivan, S.S., Williams, D.R., & Gallager, D.A. (2008). Nonmotor symtoms as presenting complaints in Parkinson's disease. *Movement Disorders, 23,* 101-106.

Poppen, R. (1998). *Behavioral relaxation training and assessment* (2nd Ed.). Thousand Oaks, CA: Sage Publications.

Raj, B.A., Corvea, M.H., Dagon, E.M. (1993). The clinical characteristics of panic disorder in the elderly: a retrospective study. *Journal of Clinical Psychiatry*, *54*, 150-155.

Shulman, L.M., Taback, R.L., Rabinstein, A.A. & Weiner, W.J. (2002). Nonrecognition of depression and other nonmotor symptoms in Parkinson's disease. *Parkinsonism and Related Disorders, 8,* 193-197.

Schumaker, R.G. (1980). The response of manual motor functioning in Parkinsonians to frontal EMG biofeedback and progressive muscle relaxation. *Biofeedback and Self-Regulation*, *5*, 229-234.

Skinner, B.F. (1957). *Verbal behavior*. NY: Appleton-Century-Crofts.

Speigler, M. D. & Guevremont, D.C. (2003). *Contemporary behavior therapy*. (4th Ed.). Belmont, CA: Wadsworth.

Stein, M.B., Heuser, I.J., Juncos, J.L., Uhde, T.W. (1990). Anxiety disorders in patients with Parkinson's disease. *American Journal of Psychiatry, 147*, 217-220.

Tarnowski, K.J. & Simonian, S.J. (1992). Assessing treatment acceptance: The abbreviated treatment acceptability rating profile. *Journal of Behavior Therapy and Experimental Psychiatry, 23*, 101-106.

Thyer, B.A. & Westhuis, D. (1989). Test-retest reliability of the Clinical Anxiety Scale. Phobia Practice and Research, 2,111-3.

Weiner, W.J., Shulman, L.M., & Lang, A.E. (2001). *Parkinson's disease*. Baltimore: Johns Hopkins University Press.

Wolpe, J. & Lazarus, A. (1966). *Behavior therapy techniques: A guide to the treatment of neurosis*. NY: Pergamon.

Yesavage, J., Brink, T., Rose, T., Lum, O., Huang, O., Adey, V., & Leier, V. (1983). Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research, 17,* 37-49.

Author Contact Information

Dr. Duane A. Lundervold,

Department of Psychological Science,
Lovinger 1111, University of Central Missouri, Warrensburg, MO 64093. Email: Lundervold@ucmo.edu