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The Perceived Effects of Dance for Individuals with
Parkinson's Disease and Healthy Amateurs

A Dissertation

Presented to

The Faculty of the Morgridge College of Education

University of Denver

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Taylor M. Mastin, M.A.

August 2015

Advisor: Cynthia McRae, Ph.D.

Author: Taylor M. Mastin, M.A.

Title: The Perceived Effects of Dance for Individuals with Parkinson's Disease and Healthy Amateurs

Advisor: Cynthia McRae, Ph.D.

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Abstract

The objective of the present study was to compare the effects of dance participation on physical and psychological functioning as perceived by two distinct groups of dancers: dancers with Parkinson's disease (PD) and healthy amateur (HA) dancers. Dancers in the Parkinson's sample group were gathered from participants in the Dance for PD® program, while healthy amateur dancers were recruited from university dance departments and through social media. Both groups were administered measures related to affect, self-efficacy, quality of life, and which aspects of dance classes were most helpful and/or challenging. Several open-ended questions for both groups were included, along with questions specific to each group. Results of the study indicated that there was no difference between the two groups on positive affect experienced while dancing, but that HA dancers experienced higher levels of negative affect than PD dancers. HA dancers exhibited higher levels of self-efficacy, but there was no difference between the groups on perceived quality of life. Additionally, both groups identified the same two components of dance classes as the most helpful: "moving and getting some exercise" and "doing something fun." Thematic analysis of responses to open-ended questions found that, in general, HA and PD dancers identified similar factors which made dance unique from other forms of exercise. The primary differences were that HA dancers more strongly emphasized artistic and spiritual components of dance, whereas PD dancers focused on the importance of the dance instructors and tailoring movements

to individuals with PD. More differences were found between the two groups with respect to the negative aspects of dance classes. Notably, PD dancers identified almost no negative aspects, while HA dancers described internal and external pressure, criticism, and competition as problematic. Future research could benefit from ensuring that both groups are administered the same standardized measures to allow for additional comparisons between groups and with normative samples.

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Chapter One

Introduction

Background

Dance has been a significant part of human society since the earliest tribal communities, and during that time it has taken on many forms and served countless purposes (Chaiklin, 2009). It has been defined as “a worldwide human activity that integrates the coordination of intentional body movements, performed in synchronization with rhythmical stimuli, usually together with other individuals” (Quiroga, Kreutz, Clift, & Bongard, 2010, p. 149-150). Dance is an art form, but it is also a method of connecting to a cultural identity, communicating religious ideas, bonding with others, celebrating important events, facilitating psychotherapy, and much more. While dance has historically been a central component of all human cultures, in the modern era of Western civilization, dance has been increasingly split into two distinct categories: folk dances performed by lay people, and professional dances performed by people with specialized training before an audience of lay people (Chaiklin, 2009). Dance and other forms of musical expression are now practiced by a minority instead of the majority (Quiroga et al., 2010). Additionally, various cultural factors, such as Cartesian dualism and the religious tenets of the major Western monotheisms, have led to a devaluing of dance in general and folk dance in particular, with some groups going so far as to ban dance

altogether (Chaiklin, 2009). Both of these philosophical foundations of modern Western society view the body as separate from, and inferior to, the mind or spirit. The body is not something to be enjoyed or celebrated, but something to be strictly monitored and tightly controlled by our higher faculties.

Despite the devaluing of dance over the past centuries of Western history, the field of psychology has recently begun to call this view into question. First, advances in neuroscience have led to doubt in the idea of dualism. Neuroscientists tend to take a monistic view of the mind-body problem, believing that once scientists develop a solid understanding of how the body and nervous system work, then they will be able to explain thought and consciousness in purely physical terms (Carlson, 2013). In this view the mind does not control the body; the mind is composed of the body.

The other way in which the field of psychology has aided the cause of dance has been by studying the effects experienced by people who dance. To date, there have been primarily two types of studies: the effects seen in healthy populations who attend dance classes as a leisure activity, and the effects seen in clinical populations with physical and/or mental illnesses who attend dance classes as part of their treatment programs. Preliminary investigations have found that dance may be related to improved emotional, physical, and social well-being, and may also be an effective strategy for coping with stress and improving self-esteem among amateur dancers (Quiroga et al. 2010). Dance has also shown potential benefits for a number of presenting concerns, including Parkinson's disease (PD; Westheimer, et al., 2015; Hackney, Kantorovich, Levin, & Earhart 2007), diabetes (Murrock, Higgins, & Killon, 2009), obesity (Murrock & Gary,

2010), depression (Jeong, Hong, Soo, Park, Kim, & Suh, 2005), and anxiety (Erwin-Grabner, Goodill, Hill, & Von Neida, 1999; Lesté & Rust, 1990).

One way in which dance may impact dancers is through an increase in perceived social support. While not ubiquitous to all forms of dance, interpersonal interaction is common to most forms of dance and dance training, from formal ballet classes to night clubs. Dance is often present when we gather to celebrate the most meaningful moments in our lives, such as rites of passage into adulthood and wedding receptions.

Psychological research into the effects of dance has begun to explore the benefits of this communal aspect of the activity. In a study of African American women diagnosed with type 2 diabetes mellitus who were enrolled in a twelve-week dance class, Murrock, Higgins, and Killon (2009) found that participants experienced camaraderie and acceptance, and that most made new friends during the process. Additionally, participants in a dance class for persons with PD reported that friendly people, being involved with others with PD, and seeing familiar faces were some of the benefits of the class, and a major part of what kept them returning to class each week (Westheimer, et al., 2015). Similar results on the benefits of social support have been found for people with PD participating in partnered Argentine Tango (Hackney, Kantorovich, & Earhart, 2007). Finally, many dancers are part of a team or company, performing and competing together for months or years. Research with collegiate athletes has found that the level of social support perceived from teammates, particularly esteem and emotional support, acts as a buffer against the negative effects of stress and increases self-confidence (Freeman & Rees, 2010).

Dance may also have a positive influence on mood and the ability to cope. Some participants in a dance class for persons with PD reported that the classes resulted in feeling happier and less discouraged, “not feeling sorry for myself,” and peace of mind (Westheimer, et al., 2015). Knestaut, Devine, and Verlezza (2010) explored the effects of a dance class for adults experiencing homelessness, and found positive influences on affect and coping. They found that participating in dance classes resulted in a decrease in negative affective states, with the largest changes observed in stress, and lesser improvements observed in sadness and frustration (Knestaut et al., 2010). In a qualitative study, Leseho and Maxwell (2010) interviewed women who danced during major life struggles (abuse, death of a loved one, etc.). Participants reported that dancing helped them to feel more empowered, to trust others and themselves, and to replace negative emotions with positive ones (Leseho & Maxwell, 2010). Quiroga and colleagues also found that dance resulted in increased positive affect and decreased negative affect (Quiroga et al., 2010) along with significantly reduced concentrations of salivary cortisol (Quiroga, Bongard, & Kreutz, 2009).

In the psychological literature, coping is often conceptualized as having two basic orientations: approach and avoidance (Roth & Cohen, 1986). Dance appears to contribute to both coping orientations, with some dancers reporting that dancing helps them to identify and express difficult emotions (Leseho & Maxwell, 2010), and others stating that while dancing, they are able to forget about problems and focus on other things (Knestaut et al., 2010). As stated above, social support, and approach-oriented coping strategy, may also contribute to the positive impact of dance on coping and affect.

Some research has also found that dance may positively influence self-esteem. One study found that dancing improved self-esteem in non-professional adult dancers, with participants reporting that they felt stronger and more self-confident as a result of dancing (Quiroga et al., 2010). A recent systematic review of the current evidence on the efficacy of dance interventions in clinical populations found that improvements self-esteem is one of the primary effects seen across studies, though the authors acknowledge that these results are preliminary (Strassel, Cherkin, Steuten, Sherman, & Vrijhoef, 2011). On the other hand, dance has a reputation for contributing to body image disturbance and eating disorders, particularly among young female dancers. Annus and Smith (2009) found that disordered eating behavior in undergraduate women was predicted, not by participation in dance classes, but by the amount of “thinness-related learning” experienced during the course of dance classes. “Thinness-related learning” experiences may include dance instructors teaching students how to lose weight, emphasizing the importance of thinness, and/or criticizing dancers for being what they perceive as too big. This may represent an area in which clinical and amateur samples differ: while clinical samples receive positive messages from instructors that encourage improvements in self-image and self-esteem (Westheimer, et al., 2015), amateur dancers who perform and compete may be more likely to be exposed to critical messages from instructors regarding body type and technical ability.

Dance has also been shown to result in improvements in balance, coordination, and physical health, which may explain some of the improvement seen in self-efficacy and self-esteem in clinical dance populations. In a comparison of older individuals who

engage in social dance with older individuals who do not dance, Verghese (2006) found that the dancers exhibited better balance and gait than the non-dancers. Dancers have also reported that dancing helps them to stay in shape and improves posture, coordination, flexibility, and balance (Quiroga et al., 2010). Studies have found that dance classes positively affect individuals with movement disorders, such as PD, in the areas of balance and motor ability (Hackney & Earhart, 2009a). Finally, participation in culturally specific dance classes has been shown to reduce body fat and body mass index (BMI) in sedentary African American women (Murrock & Gary, 2011). In general, dance appears to result in multiple physical benefits for a variety of populations.

It has been shown that dance classes allow participants the opportunity for creativity and self-expression. In a qualitative exploration of the effects of dance, creativity was frequently cited by participants (Quiroga et al., 2010). Additionally, older adults engaging in contemporary dance have been found to have more cognitive flexibility than older adults participating in other forms of exercise (Coubard, Duretz, Lefebvre, Lapalus, & Ferrufino, 2011). Self-expression has also been found to be an important component of dance, and dance has been proposed as a method of self-expression for individuals with compromised verbal communication skills (Ravelin, Kylmä, & Korhonen, 2006). Heiberger and colleagues (2011) found that individuals with PD participating in a weekly dance class began to express themselves more creatively over the course of their study. This idea was succinctly summed up by dancer Isadora Duncan: “If I could say it, I wouldn’t have to dance it” (as cited in Gardner, 1999, p. 5).

Finally, quality of life has been assessed in numerous studies, and a systematic review has found that many studies have shown improvements on this variable (Strassel et al., 2011). In a study of individuals with PD, participants reported improved quality of life after participation in a weekly dance class (Heiberger et al., 2011). Another study found that participation in Argentine Tango was related to improved health-related quality of life, where other forms of exercise were not (Hackney & Earhart, 2009a). Participation in a 12-week dance and movement therapy program has also been found to improve quality of life among breast cancer survivors (Sandel et al., 2005).

While preliminary evidence suggests that these effects are common to all dancers, there is reason to believe that they may be particularly important for people with PD. PD is a neurodegenerative disorder that significantly impacts motor abilities, and can also negatively influence mental status variables such as affect, memory, and cognition (Heiberger et al., 2011). Given that participation in dance classes has been found to have both physical and cognitive benefits, such interventions may be uniquely suited to diagnoses like PD, and dancers with this diagnosis may report perceived changes in excess of those reported by other populations.

Purpose of the Study

The purpose of the present study was to assess the effects of dance, both positive and negative, for healthy amateur dancers and persons with PD in order to explore the similarities and differences between the two groups. The clinical population examined in this study included those with PD who were enrolled in the Dance for Parkinson's Disease ® (DfPD) program at several sites in Brooklyn and New York City. While some

literature in recent years has begun to address the possible effects of dance, no study could be found at this time comparing healthy and clinical populations. The studies that comprise the literature at present focus exclusively on either healthy amateur dancers or a group with a specific clinical concern, but not both. Additionally, the current literature exploring the potential positive effects of dance on various populations is still preliminary, and current statements about the efficacy of dance in a therapeutic context are tentative at this time (Strassel et al., 2011).

Research Questions

The following research questions were addressed:

1. How do healthy amateur and PD dancers compare to each other on measures of self-esteem, affect, social support, and quality of life?
2. In response to open-ended questions, how do healthy amateur and PD dancers describe the effects of dance?
 - a. In what ways, if any, are the responses of the two groups similar and different?

Measures

The following variables and measures were included in the current study. Affect related to dancing was measured using the *International Positive and Negative Affect Schedule - Short Form* (I-PANAS-SF) developed by Thompson (2007). Self-esteem was measured using the *Rosenberg Self-Esteem Scale* (Rosenberg, 1965). Global quality of life was assessed using a single item from the *36-Item Short Form Health Survey* (SF-36; Stewart & Ware, 1992). Social support and self-efficacy were measured using scales

created for this study. The social support scale, the *Perceived Support from Dance Questionnaire* (PSDQ) was specifically developed for dancers. Additional information about each measure is provided in Chapter Three.

Limitations

There are several limitations to this study that should be noted. First, the two comparison groups differed in several key ways that may complicate the interpretation of results. For example, the sample group of adult amateur dancers was much younger (primarily in their 20's) than their counterparts in DfPD, who tended to be older adults. This age disparity may have resulted in differences caused by age or cohort effects rather than PD diagnosis. Additionally, adult amateur dancers typically have many years of dance training, while dancers in DfPD may be in a dance class for the first time. This differential amount of dance experience may also have resulted in some group differences. However, comparing two groups of dancers with so many differences may suggest broader generalizability of any similarities found.

Another limitation of the study is the sampling method used. Participants in the PD group were drawn from DfPD classes in the New York City area, and there was no random assignment to this group. This means that there may be a selection bias based on the type of person who was likely to be interested in enrolling in a dance class. There is then the additional selection bias of dance class members willing and/or able to participate in a study. Similarly, the healthy amateur dancers were not randomly assigned, and their responses may also reflect a bias toward the type of person who is interested in dance and also willing to complete a survey about their experiences.

Additionally, the recruitment methods used with the HA dancers (e-mail notification and “snowball sampling”) may have resulted in limited generalizability of the results.

Finally, all of the data gathered is based on self-report, with no external evaluations of changes in physical or psychological variables conducted. Self-report data may be influenced by biased reporting of participants or by errors in recall, which can impact results. All results should be interpreted with the understanding that they are based on the perceived effects of dance by those who participated in the activity, and not on objective benefits measured by outside observers.

Definitions of Terms

Provided below are the operational definitions of several terms that will be used throughout subsequent chapters.

Amateur Dancer. The amateur dancers in the present study are individuals who engage in dance-related activities on a regular basis (attending classes, performing, teaching, choreographing, etc.), but are not professional dancers. Participants may receive financial compensation for some or all of these activities, but this does not constitute the majority of their income. For example, a participant may be a full-time university student who teaches dance classes part-time, but a full-time dance instructor would not qualify.

Clinical Dancer. This term refers to people participating in dance classes who have an identified medical or mental health concern. The clinical population that is the focus of the present study is people with PD who are participants in the DfPD program, but other clinical populations will be referenced when reviewing the existing literature on the possible effects of dancing.

PD Dancer. This term refers to individuals with PD who participate in DfPD.

This is a subgroup of clinical dancers.

Summary

Chapter One introduced some of the potential effects of dance and factors associated with dance participation that may be found in both clinical and amateur populations. Study of the effects of dance participation is relatively early in its development as a field, and much of the existing literature is preliminary. More research is needed to contribute to this growing body of knowledge, particularly with respect to the potential similarities and differences between clinical and healthy groups of dancers. This study will begin to explore whether the effects of participating in dance vary based on the type of dancer, or if the effects are more universal. Either finding could have practical implications for the development of dance-based interventions for a number of presenting concerns. The primary variables of interest are the perceived positive and negative effects of dance participation, affect while dancing, self-esteem, social support, and quality of life. Chapter Two will present a review of the existing literature that is relevant to the present study.

Chapter Two

Literature Review

Chapter Two provides an overview of the existing literature exploring the effects of dance for both healthy amateurs and clinical populations. Some potential effects of dance and factors associated with dance participation that have been proposed include improvements in perceived social support, affect and coping, self-esteem, physical health, creativity and self-expression, and overall quality of life. This chapter will provide a broad description of Parkinson's disease (PD) and explore some of the effects dance may have on individuals with PD.

Proposed Effects of Dance

Social Support

Perceived social support refers to an individual's assessment of the degree to which an interpersonal environment is supportive (Hardesty & Richardson, 2012). Several recent studies have found that perceiving support and community within dance classes contributes to beneficial outcomes. One such study used a mixed methods approach to explore the benefits of dance and peer support in African American women diagnosed with type 2 diabetes mellitus (Murrock, Higgins, & Killon, 2009). In this study, 46 women were randomly assigned to either a 12-week dance class (meeting two times each week, for a total of 24 possible sessions) or treatment as usual. Results

showed significantly greater reductions in blood pressure and body fat in the group participating in dance classes than in the group receiving the standard intervention. The authors found that instituting behavioral changes (changing diet and exercise habits, medication adherence) was difficult for all participants, but that the participants assigned to the dance intervention were significantly more successful in accomplishing these goals than the other group. In the qualitative segment of the study, participants reported feeling supported by other group members and having a safe space to laugh and enjoy themselves. They also reported feeling a sense of camaraderie and acceptance; there was no reason to feel ashamed about their physical status because all group members were in similar circumstances. The authors suggested that this sense of social support may have also contributed to treatment adherence, which is an important aspect of any proposed intervention.

An 8-week mixed methods study of the Dance for Parkinson's Disease (DfPD) program found similar results (Westheimer et al., 2015). In this study, 14 people diagnosed with PD participated in dance classes led by instructors with extensive experience teaching healthy dance students (over ten years) and dancers with PD (at least six years). The dance classes consisted of 40 minutes of warm ups employing all parts of the body, performed while seated in a circle, 15 minutes of sequences at the barre, and 20 minutes of movement combinations moving across the floor. Dance sequences were presented using verbal instruction, and included imagery, visual focus, mental attention, visualization, repetition, mirroring, and rhythm. Of the initial 14 participants, 12 completed the class and all assessments. The participants showed significant

improvements on the Unified Parkinson's Disease Rating Scale, Part III (UPDRS III). The authors also found a very low attrition rate for this intervention. Additionally, all 12 participants who completed the study stated that they would continue to take the class if it were available. In the qualitative interviews, nearly every participant reported that the people involved in the classes (both the instructors and the other participants) were a major factor that kept them coming back each week. One participant said the "determination to feel better was contagious" and another reported feeling less alone (see Tables 4a and 4b). These results suggest that participation in the DfPD intervention was associated with improved physical and social functioning and a high level of treatment adherence.

Another study of the potential benefits of dance explored partnered ballroom dance, which provides more explicit regular interpersonal interaction. In this study, 19 participants with PD and 19 age- and gender- matched control subjects were randomly assigned to either partnered tango or traditional exercise (Hackney, Kantorovich, & Earhart, 2007). Both groups completed 20 hour-long exercise classes within a 13-week period. Results of post-intervention surveys indicated that participants in the tango group felt that the dance class fostered a sense of camaraderie and provided the opportunity for socialization. Additionally, the tango classes provided caregivers and partners with the opportunity to meet other couples in similar situations. By the end of the 13-week program, participants in the tango group were requesting to gather outside of the dance class.

Dancers in several types of classes appear to find social support in dance classes. The classes are likely to contain dancers with many similarities, whether it is a common diagnosis, a shared enjoyment of dance, or the hope that dance will keep them physically active. This sense of common purpose seems to result in improved treatment adherence in clinical groups receiving such interventions.

Affect and Coping

Dance may be an effective strategy for coping and affect-regulation, helping dancers to express negative emotions in a healthy way and increase the probability of experiencing positive emotions. In the study by Westheimer and colleagues (2015) described above, a number of participants reported that participating in DfPD resulted in affective improvements. Several participants stated that they felt happier or less discouraged at the end of the study, while others felt calmer or more contented. One participant found that “troubles go away” during dance classes (Westheimer et al., 2015, Table 4b). In general, the participants in this study felt that dance classes resulted in decreased negative affect and increased positive affect.

Another study explored the impact of regular dance classes offered in a shelter for homeless men and women. The study participants were 11 men and women who attended dance classes offered twice weekly for eight weeks in the recreation area of the shelter (Knestaut, Devine, & Verlezza, 2010). Due to the transient nature of the target population, most participants attended only a few classes. This, combined with the small sample size, suggests that the conclusions drawn by the authors are preliminary. The outcomes were measured using a combination of Likert scaled and open-ended questions

before and after each class, and the authors observed participant behavior during each class (Knestaut, et al., 2010). In the post-class surveys, participants reported increased positive affect (e.g., joyful, happy, relaxed, energetic) and decreased negative affect (e.g., stress, sadness). Participants stated that having the opportunity to focus their energy on a new activity allowed them to temporarily forget stressors in their lives, and that dance was an effective way of moving past a “bad couple of days” (Knestaut, et al., 2012, p. 300). This early evidence suggests that dance may be an effective tool for coping and affect regulation in adults experiencing homelessness.

In a qualitative study, Leseho and Maxwell (2010) explored the use of dance as a way of coping with traumatic experiences (e.g., abuse, death of a loved one). The authors interviewed 29 women between the ages of 16 and 67, from 12 different countries with various religious/spiritual beliefs. In this study, dance classes were not led or organized by the authors, but rather participants were chosen who already participated in dance classes. The authors found three major themes in their interviews: empowerment, transformation and healing, and connection to spirit. Empowerment was experienced in several ways by the participants. Those with histories of physical and sexual abuse found that dance helped them to reclaim, appreciate, and respect their bodies and their femininity. Participants also reported that dance allowed them to feel physically free and disinhibited. With respect to transformation and healing, the women stated that dance allowed them to release negative emotions (e.g., stress, depression, grief) and replace them with positive emotions (e.g., joy, vibrance, lightness); thus, experiencing transformation. Other participants reported a sense of grounding or having permission to

take up space. Finally, participants described a connection to spirit as a sense of wholeness, feeling connected to their own essence or core. Others viewed this as an expression of spirit, or a way to access the sacred within themselves.

Quiroga, Bongard, and Kreutz explored physiological explanations for why dance may influence affect and coping (2009). In this study, 22 male and female dancers participated in four experimental conditions: tango dancing with a partner and music, dancing with a partner but without music, dancing with music but without a partner, and moving with no partner or music. Participants completed the Positive and Negative Affect Schedule (PANAS) and provided salivary samples at the beginning and end of each dance condition, which were subsequently assessed for concentrations of cortisol and testosterone. In this study, cortisol was used to indicate stress level (with lower levels of cortisol suggesting lower levels of stress), and testosterone was used to assess social bonding (with higher levels of testosterone suggesting higher levels of bonding). The authors found that level of positive affect was significantly higher for the tango dance condition (with partner and music) than for the other three conditions. This group also showed a significant decrease in negative affect from the baseline to the post-treatment assessment. Levels of salivary cortisol decreased significantly (i.e., improved) in three of the four experimental conditions. Additionally, a main effect of music was found, with the conditions with music exhibiting greater decreases in salivary cortisol than the conditions without music. Results related to levels of testosterone were inconsistent. Overall, the researchers found that traditional tango dancing (with partner and music) resulted in significant increases in positive affect and decreases in negative affect and

levels of salivary cortisol. Dancers in the conditions in which some aspects of tango were removed exhibited some improvements, but not to the same degree as those dancing with both partners and music.

Dance may be an effective coping strategy in part because it allows for both active and passive coping. Dancers may use movement to express difficult emotions and face them head-on, or they may use dance as a distraction to prevent themselves from ruminating on negative emotions. Additionally, dance may help to lessen negative emotions and increase positive emotions. Dance is seen by many as a fun, creative activity, and participants across studies often emphasize that the act of dancing brings happiness and joy.

Self-Esteem and Self-Efficacy

Dancers, and specifically those in clinical populations, may benefit from the increased self-esteem and/or self-efficacy that results from dance participation. Some of the studies detailed above appear to suggest this. For example, participants in Westheimer and colleagues' (2015) study of DfPD reported feeling less helpless and more independent after participating in dance classes. Additionally, women in Leseho and Maxwell's (2010) exploration of dance as a coping strategy reported that they believed dance led to an increased sense of strength and empowerment. Several other studies have looked more explicitly at the relationship between dance participation and self-esteem.

In one study, 53 women with sedentary jobs and no regular exercise routine were divided into two groups: 25 participated in a weekly hour-long aerobic dance class for a year, while the other 28 served as a control group (Hős, 2005). The experimental group

consisted of women willing to participate in a year-long dance program, while the control group was made up of women who were unable to participate in the dance program for various reasons. The participants were administered the Rosenberg Self-esteem Scale and the Tennessee Self-image Test at baseline and at the completion of the program. The two groups did not differ on either test at baseline. After completing the year-long dance program, the experimental group scored higher on measures of self-esteem and self-image than they had at baseline. Additionally, the experimental group scored significantly higher on both measures than the control group. Regular dance participation was found to be associated with increases in self-esteem and self-image.

Additionally, a recent systematic review found that improvements in self-esteem have been one of the most consistent findings regarding the benefits of dance in clinical populations (Strassel, Dherkin, Steuten, Sherman, & Vrijhoef, 2011). This review involved a search of thirteen databases, and included existing systematic reviews, meta-analyses, and randomized controlled trials (RCTs) which collected both qualitative and quantitative data. Since their review included studies that addressed a variety of clinical populations, it is difficult to identify benefits that can be generalized across groups; however, improved self-esteem was one of the results most consistently found across studies and across diagnoses. This result suggests some potential generalizability for this finding.

There is some evidence that dance-based interventions for a variety of clinical populations may improve self-esteem; however, more intense dance participation of the type that might be seen among amateur and collegiate populations is known to correlate

with certain self-esteem challenges, particularly related to body image. A recent study by Annus and Smith (2009) explored the relationship between dance participation and body image in collegiate women. In this study, women enrolled at a university were administered several measures related to body image and disordered eating. They were also asked several questions about the environments in which they received their dance training, if any, such as how often they were weighed in front of their classmates and how often their dance instructors emphasized weight or shape during class. The authors found no significant difference between dancers and non-dancers on any measures. Learning from dance instructors who emphasized weight and body shape, on the other hand, was significantly related to five of the six measures of body image and eating disturbance. This suggests that healthy amateur dancers can receive both positive and negative messages about themselves from their dance instructors, and that developing an excessive focus on thinness can lead to body image disturbance.

Because of the anticipated differences in dance environments between DfPD and healthy amateur dancers, and the importance that the messages learned in such environments has for self-image, there is reason to believe that self-esteem may differ between the two groups in the present study. Dance programs for clinical populations, such as DfPD, are designed to create supportive environments, and there is no need for correction related to dance technique or physical appearance. In contrast, healthy amateur dancers who perform or compete may regularly receive critical feedback in these and other domains. As such, dance participation may have an entirely positive influence on

the self-esteem of DfPD dancers, whereas healthy amateur dancers are more likely to receive both positive and negative messages from instructors and classmates.

Physical Effects

Because dance is a physical activity, it seems logical that dancing will provide participants with physical effects. Several studies have explored the potential physical benefits of dance in multiple different populations. One study examined the effect of dance on movement control in people with PD (Hackney & Earhart, 2009). In this study, 58 participants with mild to moderate PD were randomly assigned to tango classes, waltz/foxtrot classes, or a control group. Those assigned to one of the two dance groups attended twice-weekly one hour classes. All groups were evaluated on balance, functional mobility, and forward and backward walking both before and after the intervention. At the baseline assessment, no significant differences were found among the three groups. The authors found that the control group's disease severity significantly worsened, while both dance groups showed significant improvements on the Berg Balance Scale, 6-minute walk distance, and backward stride length.

Another study used a quasi-experimental design to examine the possibility of using culturally specific dance to reduce the incidence of obesity in African American women (Murrock & Gary, 2010). In this study, participants were chosen from two Baptist churches in an African American community, with members of one church receiving the dance-based intervention and members of the other church comprising the control group. The intervention consisted of 45-minute culturally specific dance classes offered twice weekly for eight weeks. No significant differences were found between the experimental

and control groups at baseline. The authors found that the group receiving the dance-based intervention showed significant decreases in body fat and body mass index from baseline to eight weeks (at the end of the intervention), and that these reductions were maintained at eighteen weeks (ten weeks after the conclusion of the intervention).

To determine whether regular social dance participation provides physical protective factors as individuals age, Verghese (2006) compared a group of older social dancers, with an average age of 80.8 years, to a group of age-, gender-, and education-matched non-dancers. No experimental intervention was included in this study, but rather social dancers were identified based on the frequency with which they already participated in dance activities. Gait, strength, and balance were assessed for both groups. The author found that the social dancers exhibited better balance, walked faster, and took longer strides than the non-dancers. Significant differences were found between the groups on balance and gait, but not on strength. In a similar study, Kattenstroth, Kolankowska, Kalisch, and Dinse (2010) compared older amateur dancers to an education-, gender-, and age-matched control group on cognitive, motor, and perceptual abilities. As a whole, the group of dancers scored significantly better in all domains, with the largest difference coming in the area of posture and balance. Interestingly, the authors found that there were no significant differences between the top scorers in each group, and that the group of dancers contained no individuals who scored poorly. Thus, participating in dance activities as individuals age may in fact confer protective advantages with respect to physical functioning.

Finally, healthy amateur dancers may also view dance as conferring physical benefits. Quiroga, Kreutz, Clift, and Bongard (2010) surveyed 475 adult amateur dancers to see what they perceived the benefits of dance to be. In this study, male and female dancers ranging in age from 18 to 74 years completed an online survey containing several questionnaires and open-ended questions. The most common physical benefit reported by the participants was overall fitness and staying “in shape.” Other perceived benefits included improved posture, coordination, flexibility, balance, and decreased pain and physical impairments. Participants expressed the belief that regular dance participation decreased the symptoms of diseases ranging from osteoporosis to common colds.

Dance appears to provide physical benefits to a wide variety of populations, from healthy amateurs seeking to remain healthy to people with PD hoping to improve balance and coordination. Additionally, dance may be an enjoyable way to decrease the incidence of obesity, particularly when the intervention is specifically tailored to the target population. Finally, regular participation in dance classes may help to protect against age-related declines in physical functioning, especially with respect to balance.

Creativity and Self-Expression

Several studies detailed above address the way in which participation in dance increases creativity and self-expression. First, Quiroga and colleagues’ survey of amateur dancers found that improved creativity is commonly viewed as a benefit of dancing (2010). Additionally, Leseho and Maxwell found in their study of dance as a method for coping with traumatic experiences that creative movement and emotional expression were viewed by participants as beneficial components of dance (2010). Several other

authors have focused more exclusively on the potential benefits of creativity and self-expression in dance.

One study utilized hybrid concept analysis to explore dance in the context of mental health nursing (Ravelin, Kylmä, & Korhonen, 2006). This process consisted of three phases: the theoretical phase (which relied primarily on a review of the literature), the field work phase (which involved focus group discussions), and the analytical phase (in which information from the literature and focus groups are combined into a cohesive model). Through this process, the authors identified several attributes of dance and consequences of dance, and they developed a comprehensive definition of dance in mental health nursing. The attributes of dance included “creative,” “expression...by body movement,” and “revealing,” while the consequences of dance included “expressing and process of emotion,” “disclosure of one’s self,” and “self-expression” (Ravelin, et al., 2006, p. 311).

Another study examined the benefits of regular dance class attendance for people with PD (Heiberger et al., 2011). In this study, eleven people aged 58 to 85 years with moderate to severe PD participated in a 1.25-hour long weekly dance class for eight months. The dance classes were based on the structure of a traditional ballet class and were led by a professional dance teacher. The authors assessed several physical and cognitive variables during the course of the study. The results of the physical evaluations were consistent with other studies of dance classes for people with PD cited in this review; however, one finding that was unique to this study was that participants reported an increase in their ability to express themselves and their emotions creatively.

High levels of creativity have also been found to be related to high levels of cognitive flexibility (Chen, Yang, Li, Wei, & Li, 2014). Coubard and colleagues explored the potential benefits to cognitive flexibility of participating in contemporary dance classes for older adults (2011). In this study, the authors compared older adults participating in a contemporary dance class that emphasized improvisation to sex-, age-, education-, socio-economic status-, and mental status-matched groups participating in Tai Chi Chuan or fall prevention classes. Participants were assessed on several measures of cognitive flexibility, including a Stroop test and rule shift card test taken from the Behavioral Assessment of the Dysexecutive Syndrome battery. The authors found that older adults participating in the contemporary dance class exhibited significantly improved cognitive flexibility, whereas participants in Tai Chi Chuan and fall prevention classes showed no improvements.

Finally, some evidence suggests that the type of dance in which a person participates can influence the degree to which benefits to creativity are found. Fink and Woschnjak (2011) compared professional dancers who specialize in three different styles: modern/contemporary, jazz/musical, and ballet. Sixty male and female professional dancers ranging in age from 18 to 45 years participated in the study (20 participants in each of the three dance styles). Each dancer was assessed on several measures of creativity and personality style (based on the Big Five model of personality). The study found that the modern/contemporary dancers exhibited the highest levels of creativity, followed by jazz/musical dancers, and then ballet dancers. The authors attribute this to the fact that modern/contemporary dancers frequently improvise, while most ballet

choreography is rigidly predefined. Additionally, modern/contemporary and jazz/musical dancers were found to have higher levels of openness than ballet dancers, and ballet and jazz/musical dancers had higher levels of conscientiousness than modern/contemporary dancers.

Recent studies suggest that participating in dance allows for increased self-expression and creativity. Additionally, the creativity involved in dance may provide some protective benefits against age-related cognitive decline. Some of the benefit to creativity and cognitive flexibility appear to come from the improvisation of dance movement (which may also allow for more self-expression than performing movements choreographed by another person). Some dance styles, such as modern or contemporary, may be more conducive to maximizing these benefits by encouraging improvisation over strict adherence to preset choreography.

Quality of Life

Numerous studies have sought to establish that dance improves overall perceived quality of life, particularly in clinical populations. In the systematic review of dance therapy effectiveness outlined above, quality of life was frequently cited as a target variable (Strassel et al., 2011). The authors found that the preliminary evidence in this field supports the assertion that dance may improve quality of life, especially among older adults or people diagnosed with chronic illnesses. Additionally, the study referenced above conducted by Heiberger and colleagues (2011) also assessed quality of life. These authors found that quality of life improved over the course of the study in both the dancers with PD and their caregivers.

One recent study explored the potential quality of life benefits of participating in Turkish folklore dance (Eyigor, Karapolat, Durmaz, Ibisoglu, & Cakir, 2009). In this randomized controlled trial, 40 healthy women over the age of 65 years were randomly assigned to either a Turkish folkloric dance-based exercise or to a control group. The intervention group met for one hour three times each week. Participants were assessed on several measures at baseline and after eight weeks of the dance-based intervention. Quality of life was assessed using the SF-36. No significant differences were found between the two groups at baseline. The authors found that participants in the intervention group made significant improvements on several SF-36 subscales, while the control group exhibited a significant decrease in general health scores on the SF-36. While quality of life improved in the group of dancers, it stayed the same or decreased in the control group.

Finally, the influence of dance movement therapy on quality of life was examined by Bräuninger (2012) through a randomized controlled trial. In this study, quality of life was assessed using the World Health Organization Quality of Life Questionnaire 100 (WHOQOL-100). One hundred and sixty-two participants were randomly assigned to either the treatment group or a wait-list control group. Members of the treatment group participated in a 10-week dance movement therapy intervention, and all participants were assessed at baseline, at the conclusion of the 10-week intervention, and 6 months after baseline. The results showed that the treatment group scored higher on all WHOQOL-100 domains at both 10-week and 6-month follow-ups than at baseline. Additionally, the treatment group scored significantly higher than the control group on all domains.

Strong evidence, including a systematic review and two randomized controlled trials, supports the idea that dance-based interventions improve quality of life. This result appears to hold true over a broad range of domains (general physical health, level of independence, etc.) and for a variety of populations. It also appears to be true for both clinical populations and healthy adult populations.

Dance and Parkinson's Disease

While dance-based interventions have been found to be beneficial for a number of clinical concerns, there are several reasons to believe that they may be particularly useful for individuals diagnosed with PD. PD is a neurological disorder caused by the degeneration of dopamine-secreting neurons in the substantia nigra that communicate with structures in the basal ganglia, and common symptoms include muscular rigidity, slowness of movement, a resting tremor, and postural instability (Carlson, 2013). Because of these motor impairments, people with PD are especially prone to falls and accidents (Carlson, 2013), which can in turn lead to broken bones and other injuries.

Regular dance class attendance may reduce the risk of fall and injury in people with PD by specifically targeting areas of weakness in this population. For example, a pilot study conducted by Hackney and Earhart (2009b) found that participants in a tango class exhibited significant improvements on several measures of motor ability. In this study, 14 individuals with mild to moderately severe PD completed ten 1.5 hour long Argentine tango lessons within a two-week period. Participation in the tango class was associated with improvements on measures of balance, motor ability, and gait. Hackney and Earhart suggested that instruction in Argentine tango may provide added benefit

because participants not only practice walking forwards, but also regularly walk backwards while dance partners provide additional support and stability (2009b).

In a follow-up study, Hackney and Earhart (2010) found that both partnered and non-partnered dance produce significant and lasting improvements in balance, gait, and cadence. In this study, participants were randomly assigned to participate in either a partnered or a nonpartnered tango class. Both classes met twice per week for hour-long classes. Both groups exhibited similar results on measures of physical improvement, but the participants in the partnered dance class reported enjoying the class more and expressed more interest in continuing the dance program. The authors proposed that the equivalent gains seen in the two groups may result from participants in the partnered dance classes taking additional risks with respect to gait and balance because of the steady presence of a partner. However, they cautioned that relying too heavily on a partner for balance may inhibit potential gains (Hackney & Earhart, 2010). The authors suggested that partnered dance may have a slight advantage with respect to treatment adherence.

In addition to Argentine tango, ballet training has also been found to improve muscle coordination and balance. In one study, Simmons (2005) compared a group of 15 female intermediate to advanced ballet dancers to a control group of 16 participants with no ballet training (matched on sex, height, and weight) on the rapidity of neuromuscular reactions to maintain balance given postural perturbations. This study found that the group of ballet dancers exhibited significantly quicker long latency neuromuscular responses than the control group. Simmons (2005) suggested that these results have

implications for physical rehabilitation in clinical populations characterized by neuromuscular difficulties, such as PD. Ballet and other forms of dance training may target specific deficits for this population.

Summary

This chapter outlined the existing research on how dance may influence the variables of interest in the present study: social support, affect and coping, self-esteem, physical health, creativity and self-expression, and quality of life. Dance participation has been found to be related to each of these variables across a variety of clinical and healthy populations. Some, such as perceived social support, are almost always found to be improved by dance participation, while others, such as self-esteem, may vary more by population. Additionally, this chapter outlined several reasons why dance might be particularly beneficial for people with PD. Finally, some pathways through which dance may influence these variables, such as increasing emotional expression and decreasing cortisol levels influencing stress levels, were explored. Chapter Three will outline the research methodology employed in the present study, including measures, hypotheses, and means of data analysis.

Chapter Three

Methodology

Chapter Three presents information on participants, sample size, measures, procedures, and data analyses. The present study explored the similarities and differences between clinical dancers with Parkinson's disease (PD) and healthy amateurs. The PD dancers were participants in the Dance for Parkinson's Disease (DfPD) program, and the amateur dancers came primarily from university dance programs. Several studies exist exploring the benefits of dance for various clinical populations and for amateurs, but no studies could be found to date comparing the two groups. Given the current dearth of information on this topic, few empirically validated measures could be found that were applicable to the purposes of the present study. As such, some data were gathered primarily through measures created specifically for this study and through open-ended questions. As this is an exploratory study, future studies in this area can further address the findings using more targeted methods. Additionally, the data from the PD dancers were gathered in partnership with the Brooklyn Parkinson Group, who were interested in evaluating the efficacy of the Dance for PD ® program. Because their goal was primarily program evaluation, and because a lengthy survey is difficult for individuals with PD to complete, some of the measures were administered to only the healthy amateur sample.

Participants

The present study was comprised of two distinct groups of participants. The first group included individuals with PD who were participating in the DfPD program. Participants were recruited from two DfPD groups in New York City. Only dancers with at least 6 months of regular attendance to DfPD groups were invited to participate. Most participants completed the survey online on a site hosted by Dance for PD®, but some completed pencil-and-paper surveys. Potential participants were asked to complete the online survey during DfPD classes, and pencil-and-paper surveys were made available upon request. Responses were received from 61 individuals, and the response rate was approximately 45%. To decrease the possibility of social desirability influencing responses, participants were asked not to include their names so that the survey could remain anonymous. Additionally, the introduction to the survey was carefully worded to avoid the use of leading language that could have primed participants to respond negatively or positively (Appendix A).

The second group were healthy amateur dancers. Participants in this group included dancers at the collegiate level, members of amateur dance teams, and/or part-time dance instructors. Participants were recruited through a form of snowball sampling wherein participants contacted other potential participants through e-mail and social media and invited them to participate. Participants were excluded from the study if they were under 18 years of age, if they were employed full-time in dance-related activities, or if their dance participation was solely for the purpose of treatment for physical or mental health concerns. Two dance department faculty members who were contacted about

forwarding the survey to their students also completed the survey themselves, and their results were excluded from analyses since dance-related activities constitute their primary source of income. Participants were recruited from 50 dance departments across the United States and via social media. Dance department chairs were sent an invitation letter and a link to the survey website, and were asked to pass them both along to dancers in their departments. Because it is unknown how many of the department chairs chose to pass along the survey information, how many students were enrolled in each department, or how many individuals viewed the link posted via social media, it is not possible to determine the percentage of those who were recruited who decided to complete the survey. One hundred and thirty-six individuals consented to participate in the study, and of these, 96 surveys were included in analyses (38 participants did not complete the survey, and 2 did not meet inclusion criteria). This resulted in a completion rate of 69.6%.

Procedures

Permission to conduct this exploratory study was received from the Institutional Review Board of the University of Denver. Participants in the DfPD group were recruited through DfPD classes in New York City, and the survey was hosted on-line by Dance for PD ®. Healthy amateur participants were recruited through e-mail and social media, and the survey was hosted electronically through Qualtrics. University dance department administrators were e-mailed and asked to forward the study description and survey link to their students. Dance departments were found by conducting a Google search for "university dance department." In order to reach a large number of dancers at each

university, only universities offering a major in dance were selected. The top 50 search results that met inclusion criteria were contacted and asked to participate. A brief study description and survey link was also posted the social media site, Facebook, in order to make use of "snowball sampling," as dancers could both participate and pass the link along to other dancers with whom they are acquainted.

Measures

Several measures were administered to both sample groups for the purpose of making comparisons. Additionally, some measures were administered exclusively to one group or the other. There are several reasons for the differences between the two questionnaires. First, some measures were only applicable to one group (e.g., assessing the impact of dance on ability to complete activities of daily living was only relevant to the PD dancer sample). Additionally, data from the PD dancers were initially gathered as part of a DfPD program evaluation project. For this reason, the DfPD research team was reluctant to add additional measures to their survey that could increase the burden on participants without providing useful feedback for improving DfPD.

It should also be noted that not all PD dancers were given the same questionnaire. Some participants completed questionnaires on-line, while others completed a pencil-and-paper version. The pencil-and-paper version was made available upon request to allow for the participation of dancers with limited Internet access. These two versions of the survey differed slightly, which resulted in different sample sizes for different questionnaires. Table 1 illustrates which measures were administered to each group, including the number of participants who completed each measure. Some items do not

have a reported sample size. For the demographics information, this is because missing data resulted in sample sizes that varied across items (some demographic questions were only included in the on-line version of the survey, and some participants neglected to respond to every question that was presented). Additionally, the measures addressing the benefits and challenges of dance and symptom changes within the PD dancer sample were designed to be endorsed if they applied to the participant or left blank if they did not. Cronbach's α was used to assess the reliability of the measures utilized in the study (Table 2). The reliability of most measures was found to be quite high, and all fell within an acceptable range for an exploratory study.

Table 1: Measures

| HA Dancers | | PD Dancers | |
|------------------------|--------|--------------------------------|--------|
| Scale | n | Scale | n |
| Demographics | Varied | Demographics | Varied |
| I-PANAS-SF Positive | 96 | I-PANAS-SF Positive | 47 |
| I-PANAS-SF Negative | 96 | I-PANAS-SF Negative* | 48 |
| RSES | 95 | Self-Efficacy Scale | 32 |
| Self-Efficacy Scale | 96 | Quality of Life | 49 |
| PSDQ | 96 | Benefits of Dance | Varied |
| Quality of Life | 96 | 2 Open-Ended Questions | Varied |
| Benefits of Dance | 96 | Challenges of Dance | Varied |
| 4 Open-Ended Questions | Varied | ADLs | 33 |
| | | Symptom Changes (Self-Report) | Varied |
| | | Symptom Changes (Other-Report) | Varied |

*PD dancers were administered an altered version of the I-PANAS-SF
 I-PANAS-SF: *International Positive and Negative Affect Schedule - Short Form*; PSDQ: *Perceived Support from Dance Questionnaire*; RSES: *Rosenberg Self-Esteem Scale*

Demographics

The demographics measured for the PD dancers included age, gender, years of education, year diagnosed with PD, length of time attending DfPD, frequency of DfPD

attendance, and whether or not the participant took dance lessons at any prior time (Appendix B). Unfortunately, several of the participants from the DfPD sample were given an alternate form of the survey that did not assess for all demographic variables. As a result, this information is not available for the entire sample. The demographics measured for the

Table 2: Reliability

| Scale | Cronbach's α | n of Items | n of Cases |
|--------------------------|---------------------|------------|------------|
| Self-Efficacy (HA) | 0.917 | 8 | 96 |
| Self-Efficacy (PD) | 0.947 | 8 | 32 |
| I-PANAS-SF Positive (HA) | 0.672 | 5 | 96 |
| I-PANAS-SF Positive (PD) | 0.862 | 5 | 47 |
| I-PANAS-SF Negative (HA) | 0.770 | 5 | 96 |
| I-PANAS-SF Negative (PD) | 0.705 | 4 | 48 |
| RSES (HA) | 0.893 | 10 | 95 |
| PSDQ (HA) | 0.842 | 10 | 96 |
| ALDs (PD) | 0.926 | 12 | 33 |

I-PANAS-SF Positive: *International Positive and Negative Affect Schedule - Short Form, Positive Affect Subscale*; I-PANAS-SF Negative: *International Positive and Negative Affect Schedule - Short Form, Negative Affect Subscale*; PSDQ: *Perceived Support from Dance Questionnaire*; RSES: *Rosenberg Self-Esteem Scale*

healthy amateurs included age, gender, years of education, years of dance experience, frequency of dance participation, and the type(s) of dance-related activity in which the dancer has participated (Appendix C).

Affect

Affect during dance participation was measured using the *International Positive and Negative Affect Schedule - Short Form* (I-PANAS-SF; Thompson, 2007; Appendix D). The I-PANAS-SF is based on the original PANAS (Watson, Clark, & Tellegen, 1988), but incorporated several important changes. First, the I-PANAS-SF was shortened

from 20 items to 10, making it less time-consuming and more conducive to inclusion in a questionnaire that includes other measures and open-ended questions. Another major change from the PANAS to the I-PANAS-SF was the elimination of affective terms whose connotations can vary by demographic membership (e.g., "proud" can be seen as positive or negative) and terms that may be unfamiliar to non-native English speakers (such as "jittery"). This makes the I-PANAS-SF more appropriate for use with multicultural participant groups (Thompson, 2007).

Exploratory principal component analysis with varimax rotation produced a two-factor (positive affect and negative affect) model of the measure, and confirmatory factor analysis supported the goodness of fit of the two-factor model (Thompson, 2007). Additionally, correlations between the positive and negative affect subscales of the I-PANAS-SF and the PANAS resulted in correlation coefficients similar to the two-month test-retest reliabilities found in the original studies of the PANAS (Thompson, 2007). The I-PANAS-SF was used in the present study to measure state affect while dancing. The items are answered on a five point Likert scale, with "1" indicating that the participant "never" experiences a particular affect while dancing and "5" indicating "always" (Thompson, 2007). To better suit their program evaluation purposes, researchers at DfPD altered one of the I-PANAS-SF items on the surveys administered to dancers in the PD sample ("Graceful" was substituted in place of "Afraid"). For this reason, the two samples could be compared on their total Positive Affect subscale scores, but only four of the five Negative Affect subscale items. Additionally, because of the deviation from standardization, the PD dancers could not be compared to the normative sample.

Self-Esteem

Self-esteem was measured using the *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965; Appendix E). The RSES is the most commonly used measure of self-esteem in the field of psychology, and it has been used with a wide array of age groups (Huang & Dong, 2011), which makes it particularly useful for the present study. A recent study explored the psychometric properties of the RSES, with particular attention to its applicability across diverse populations (Sinclair et al., 2010). The authors recruited a large nonclinical sample of adults living in the United States that varied by gender, race/ethnicity, age, education, employment, income, and marital status. The results of this study found that the RSES exhibited acceptable convergent validity, discriminant validity, internal consistency reliability, and floor and ceiling effects (Sinclair et al., 2010). Although the RSES was initially designed to assess self-esteem in adolescents, these results support its use with diverse adult populations.

The RSES is a 10-item scale scored on a four point Likert scale ranging from 0, "Strongly Disagree," to 3, "Strongly Agree" (Rosenberg, 1965). Possible scores could range from 0 to 30. Because of the emphasis on keeping the survey administered to PD dancers short to decrease survey fatigue, this scale was only administered to the healthy amateur dancers. Sample items include "On the whole, I am satisfied with myself" and "I am able to do things as well as most other people."

Self-Efficacy

Self-efficacy was measured using a questionnaire adapted from the one developed by Lorig and colleagues (1993) in their work on self-efficacy for pain management

among individuals with arthritis. A similar measure was used by McRae et. al. (2004) in a previous study exploring quality of life in individuals with PD participating in a surgical trial. Participants were given the prompt: "How certain are you that you can..." followed by each item of interest (Appendix F). Sample items include "Make positive changes in your life?" and "Develop a sense of community with others?" The scale consisted of 8 items scored on a Likert scale from 1, "Not at all Certain," to 7, "Very Certain." Total scores could range from 8 to 56. Both groups of dancers were administered this measure. Similar measures used in previous studies have demonstrated acceptable reliability and validity (Lorig, Mazonson, & Holman, 1993; McRae, et. al., 2004).

Social Support

Social support was measured using an instrument developed for the purposes of this study: the *Perceived Support from Dance Questionnaire* (PSDQ; Appendix G). Based on a review of the literature, no extant scale could be found that addressed the construct of social support in a way that was meaningful for this project. Some instruments were found that addressed the construct adequately, but did not appear to assess the type of support related to what may evolve through a shared experience such as a dance class. The PSDQ consists of 10 items scored on a five point Likert scale ranging from 1, "Strongly Disagree," to 5, "Strongly Agree." Total scores could range from 10 to 50, with higher scores indicating higher levels of perceived social support. Items include "When I have a problem, I can talk to other dancers about it" and "I feel isolated from others in my dance

class" (reverse scored). To decrease the likelihood of survey fatigue among PD dancers, this scale was only administered to the healthy amateur dancers.

Quality of Life

Quality of life was assessed through a single item: "My quality of life at present is:" with the possible responses ranging from 1, "Excellent," to 5, "Poor." This question is the first item from the *36-Item Short Form Health Survey* (SF-36; Stewart & Ware, 1992). This item was reverse-scored, so that higher scores suggest higher perceived quality of life. Additionally, responses to open-ended questions provided further information related to the impact that dance attendance had on participant quality of life.

Activities of Daily Living

In order to assess the impact of DfPD participation on functioning outside of the dance classes, a measure assessing changes in ability to perform activities of daily living (ADLs) was administered to PD dancers (Appendix H). Questions were related to improvements in balance, mobility, and other symptoms that participation in a dance class could be expected to address (e.g., "I find it easier to get around the house" and "I trust my balance more when I'm out and about"). The measure was scored on a four point Likert scale ranging from 2, "Strongly Disagree," to 5, "Strongly Agree," with a fifth available option of 1, "Not Sure." The scale consisted of 12 items. The minimum possible score was 12 if a participant answered every item with "Not Sure." The lowest possible score if a participant strongly disagreed with every item was 24. The highest possible score was 60.

Benefits Challenges of Dance

As part of their program evaluation efforts, researchers with the Brooklyn Parkinson Group developed measures to determine what DfPD participants see as the benefits and challenges of participating in a dance program. The measure assessing the benefits of dance asked participants to indicate which components of dance classes they viewed as most valuable (e.g., "doing something creative," "social interactions with other class members"). The scale was initially designed to be scored on a Likert scale ranging from 1, "Not at all," to 4, "A great deal;" however, it was changed to a checklist format prior to administration to PD dancers (Appendix I). Unfortunately, this format change occurred after the HA portion of the study had received IRB approval. For this reason, the HA dancers were administered the original, Likert-scale version of the measure (Appendix J). Additionally, the version administered to HA dancers did not differentiate between live and pre-recorded music, as the PD dancer version did, because live music is not a standard component of most dance classes.

PD dancers were also given a measure asking them to identify those aspects of dance that they found particularly challenging (Appendix K). This measure also used a checklist format and included items such as "doing a series of different movements in a set amount of time" and "being spontaneous during improvised exercises." Because the items in this measure specifically targeted difficulties typical of PD, this measure was not administered to HA dancers.

Symptom Changes

Two additional measures were developed to assess potential changes in PD symptoms resulting from participation in DfPD. The first measure asked participants to indicate how much they believed DfPD impacted various symptoms (Appendix L). Items, such as "Improves motor symptoms" and "Helps me feel like my pre-Parkinson's self for a while," were scored on a Likert scale ranging from 1, "Not at all," to 4, "A great deal." Participants were also asked to indicate how long they believed these benefits last, ranging from "until the class is over" to "a month," with the additional option of "I don't know."

The other measure of symptom change asked PD dancers to report observations they have heard others (e.g., family members, physicians) make about any possible symptom changes (Appendix M). This measure was included for the purpose of determining whether changes in functioning were noticeable to outside observers, and how these observations did or did not differ from participants' self-evaluations of symptom change. It was administered in a checklist format and included items such as "They say I perform activities of daily living more easily" and "They say that I walk more easily." Because these measures specifically addressed PD symptoms, they were not administered to HA dancers.

Open-Ended Questions

To supplement the quantitative information gathered from the measures described above, qualitative data were gathered from open-ended questions (Appendices N and O). Both HA and PD dancers were asked to describe what makes dance classes different from

other forms of exercise in which they have participated. Both groups were also asked to identify what, if anything, they dislike or would like to change about their respective dance classes.

HA dancers were asked two additional open-ended questions that were not included in the questionnaire administered to PD dancers. HA dancers were asked whether or not dance helped them to cope. Those who answered "yes" were given the prompt "Tell me more about it." The inclusion of the closed-ended question prior to the open-ended question was intended to prevent leading participants to respond in a particular way. Formatting the survey this way, as opposed to simply asking how dance helped participants to cope, avoided the assumption that all participants view dance as a coping tool and allowed participants the opportunity to indicate that they did not see dance as such.

Participants were then asked if they experience any physical effects, positive or negative, resulting from their dance participation. Again, this screening question was added to avoid the assumption that all dancers experience physical effects. Those who answered in the affirmative were prompted to "Tell me more about them." PD dancers were not asked these questions for two reasons. First, information regarding the physical effects of dance participation among PD dancers was gathered using the quantitative measures assessing symptoms changes and ADLs described above. Second, due to difficulties with fine motor skills, asking PD dancers to answer multiple open-ended questions could have become overly burdensome.

Data Analysis

Several statistical methods were used to conduct quantitative analyses. The two sample groups were compared to each other using Analysis of Variance (ANOVA). One sample *t*-tests were used to compare HA dancers to normative samples on the RSES and I-PANAS-SF. Cronbach's α was used to assess the reliability of the measures utilized in the study. Finally, Pearson Correlations were used to explore the relationships among variables. Data from the open-ended questions were used to supplement and expand upon the results found through quantitative analyses. Qualitative analyses were conducted using Thematic Analysis (TA). This method of analysis entails looking for themes across an entire data set (as opposed to within a single data point, such as an interview) independent of a pre-existing theoretical framework (Braun & Clarke; 2006).

Summary

This chapter presented an overview of the two groups of participants in the study, along with a description of the measures that were used. Procedures for conducting the study, including a description of the data analyses, were also presented. Because this study was primarily exploratory, some of the data were gathered through questionnaires created specifically for the purposes of this study. Results were supported by responses to open-ended questions. Chapter Four presents results of the study, including a description of demographic information, results of preliminary and primary analyses performed, and thematic analysis of qualitative data gathered from open-ended questions.

Chapter Four

Results

This chapter presents the results of both qualitative and quantitative analyses performed on the data associated with the current study. Results will be discussed in three sections. The first section, Preliminary Analyses, will explore descriptive statistics of the two sample groups. The second section, Quantitative Analyses, will present the results of quantitative questionnaires administered to each sample group and make comparisons between them. The third section, Qualitative Analyses, will explore the qualitative data gathered in response to open-ended questions from both sample groups and compare and contrast the responses of the groups. All quantitative analyses were performed using the Statistical Package for the Social Sciences Version 22 (SPSS 22). All statistical analyses used two-tailed tests of significance with an alpha level of $p < .05$. Qualitative analyses were conducted using Thematic Analysis (Braun & Clarke; 2006).

Preliminary Analyses

Healthy amateur (HA) dancers were invited to complete an online survey either through university dance department chairs or through social media. One hundred and thirty-six individuals consented to participate in the study, but 38 of these did not complete the survey. Of the 38 individuals who did not complete the survey, 20 consented to participate and then went no further, while the remaining 18 completed the

survey to varying degrees. Ninety-eight complete surveys were received from this sample. However, two of these were submitted by university dance professors who do not meet the criterion of amateur as previously defined for this study; specifically, the stipulation that payment for dance-related activities not constitute the majority of the participant's income. As such, these two surveys were excluded from subsequent analyses, leaving a sample size of 96. The sample of dancers with PD consisted of 61 participants for most questionnaires, and 40 for the others.

Little's MCAR test of the randomness of missing data indicated that missing data were missing completely at random from both the amateur sample ($p = 0.80$) and the PD sample ($p = 1.00$). While some data was missing due to inconsistencies in the administration of surveys, it was not enough to reach statistical significance according to Little's test. Several measures administered were in the format of a checklist, on which participants marked all responses that applied to them. Because items left blank were not necessarily missing, but rather could have been purposely left blank, these measures were not included in tests of the randomness of missing data. The questionnaires included in Little's MCAR test for the HA dancers were the I-PANAS-SF Positive, I-PANAS-SF Negative, RSES, Self-Efficacy, PSDQ, Quality of Life, and Benefits of Dance. The measures included for PD dancers were the I-PANAS-SF Positive, I-PANAS-SF Negative, Self-Efficacy, Quality of Life, and ADLs.

Demographic information was gathered (Appendix C) to better understand the characteristics of the sample. Table 3 presents demographic data for the healthy amateur sample and Table 4 presents demographic data for the PD sample. The high level of

Table 3: Characteristics of the Healthy Amateur Sample

| | | Number | Percent | | |
|--|----------------------|--------------------------|---------|--------|----|
| Gender | Male | 8 | 8.3 | | |
| | Female | 87 | 90.6 | | |
| | No Response Given | 1 | 1.0 | | |
| Race/Ethnicity | Native American | 1 | 1.0 | | |
| | Caucasian/White | 66 | 68.8 | | |
| | Hispanic | 8 | 8.3 | | |
| | Asian | 7 | 7.3 | | |
| | Biracial/Multiracial | 9 | 9.4 | | |
| | Other | 3 | 3.2 | | |
| | No Response Given | 2 | 2.1 | | |
| | Educational Level | High School (No College) | 5 | 5.2 | |
| 1 Year of College | | 23 | 24.0 | | |
| 2 Years | | 17 | 17.7 | | |
| 3 Years | | 17 | 17.7 | | |
| 4 Years | | 13 | 13.5 | | |
| 5 Years | | 5 | 5.2 | | |
| 6 Years | | 2 | 2.1 | | |
| 7+ Years | | 12 | 12.5 | | |
| No Response Given | | 2 | 2.1 | | |
| How frequently, on average, do you engage in dance related activities? | | Daily | 55 | 57.3 | |
| | Several Times a Week | 21 | 21.9 | | |
| | Every Week | 4 | 4.2 | | |
| | Every Two Weeks | 2 | 2.1 | | |
| | Once A Month | 12 | 12.5 | | |
| | No Response Given | 2 | 2.1 | | |
| In what types of dance activities have you participated? | Major/Minor | 76 | 79.2 | | |
| | Choreographer | 65 | 67.7 | | |
| | Instructor | 59 | 61.5 | | |
| | Recreational Classes | 58 | 60.4 | | |
| | Dance Company | 57 | 59.4 | | |
| | Competition Team | 42 | 43.8 | | |
| | Other | 21 | 21.9 | | |
| | Spirit/Pom Squad | 17 | 17.7 | | |
| | Drill Team | 10 | 10.4 | | |
| | Min | Max | Mean | St Dev | n |
| Age | 18 | 62 | 24.08 | 9.41 | 95 |
| For how many years have you danced? | 0 | 59 | 16.35 | 9.80 | 93 |

| | | | | | |
|-----------------------------------|---|---|------|------|----|
| Years of post-secondary education | 0 | 7 | 2.99 | 2.07 | 94 |
|-----------------------------------|---|---|------|------|----|

Table 4: Characteristics of the PD Sample

| | | Number | Percent | | |
|--|--------------------|--------|---------|--------|----|
| Gender | Male | 13 | 21.3 | | |
| | Female | 27 | 44.3 | | |
| | No Response Given | 21 | 34.4 | | |
| Education | 13 Years | 2 | 3.3 | | |
| | 14 Years | 3 | 4.9 | | |
| | 15 Years | 1 | 1.6 | | |
| | 16 Years | 8 | 13.1 | | |
| | 17 Years | 1 | 1.6 | | |
| | 18 Years | 4 | 6.6 | | |
| | 20 Years | 10 | 16.4 | | |
| | 21 Years | 1 | 1.6 | | |
| | 23 Years | 1 | 1.6 | | |
| | No Response Given | 30 | 49.2 | | |
| How long have you participated in DfPD? | Less than 6 Months | 8 | 13.1 | | |
| | 6 Months to 1 Year | 13 | 21.3 | | |
| | 1 to 2 Years | 9 | 14.8 | | |
| | More Than 2 Years | 10 | 16.4 | | |
| | No Response Given | 21 | 31.4 | | |
| Had you taken any dance classes prior to DfPD? | Yes | 43 | 70.5 | | |
| | No | 12 | 19.7 | | |
| | No Response Given | 6 | 9.8 | | |
| | Min | Max | Mean | St Dev | n |
| Age | 42 | 92 | 65.84 | 11.77 | 38 |
| Years of Education | 13 | 23 | 17.55 | 2.63 | 31 |

missing data for this questionnaire was due to inconsistencies between the on-line and pencil-and-paper versions of the survey, which assessed different demographic variables. Among the amateur dancers, two participants who selected "other" in response to the question about race/ethnicity provided further clarification. They described themselves as

"Filipino" and "Latina." The "other" prompt in response to the question about participation in types of dance activities generated 26 responses, including "adjudicator," "pre-professional company," "consultant," and "musical theater."

Pearson's Chi-Square test indicated a difference in the gender distribution of the two groups, with the PD sample having more male participants (Table 5; $X^2[1, N = 135] = 12.424, p < .001$). It is not surprising that there are more male participants in the PD sample as the incidence of PD is approximately twice as high among men as women (Van Den Eeden, et al., 2002). Despite the fact that PD disproportionately impacts men, the PD sample included twice as many women as men. The fact that both samples were predominantly female may reflect societal perceptions of dance as an inherently feminine activity.

Table 5: Chi Square Analysis of Gender in the Samples

| | Male | Female | Total |
|-----------------|-------|--------|--------------|
| Healthy Amateur | 8 | 87 | 95 |
| Parkinson's | 13 | 27 | 40 |
| Total | 21 | 114 | 135 |
| | Value | df | Significance |
| Pearson X^2 | 12.42 | 1.00 | <0.001 |

Results of independent samples *t*-tests indicated that the two groups also differed with respect to age and level of educational attainment (Table 6). Level of education was measured differently for the two groups. HA dancers were asked for years of education after high school (with a maximum value of 7), while PD dancers were asked for total years of education. The responses of the PD sample were adjusted to address this discrepancy and allow for comparison. PD dancers were found to be older and have

completed more years of education than HA dancers. This is not surprising as PD is generally diagnosed in older adulthood. Additionally, the majority of HA dancers were recruited through university dance departments, meaning that they had not yet completed their education at the time they participated in the study.

Table 6: Comparisons of Age and Education

| Variable | HA Mean | PD Mean | t | df | Sig |
|-----------|---------|---------|---------|---------|-------|
| Age | 24.08 | 67.03 | -18.453 | 53.086 | <.001 |
| Education | 2.99 | 5.10 | -4.969 | 123.000 | <.001 |

The HA dancer sample was compared to a normative sample from the United States for the I- PANAS-SF (Thompson, 2007). One sample t-tests indicated that the HA dancers scored higher than the normative sample on the Positive Affect subscale ($t(95.00) = 8.089, p < .001$) and lower on the Negative Affect subscale ($t(95.00) = -5.321, p \leq .001$), suggesting that dance participation is associated with differences in affect. The PD dancer sample could not be compared to the normative sample because they were not administered a standardized version of the I-PANAS-SF, as described previously in the Chapter Three.

Scores for the HA dancers on the *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965) were also compared to normative averages. Population averages were obtained from a recent study by Sinclair, Blais, Gansler, Sandberg, Bistis, and LoCicero (2010) exploring the psychometric properties of the RSES. The average score on the RSES for the HA sample was 21.65. This is lower than the average for adults living in the United States (22.62), but not significantly so ($t(94) = -1.781, p = .078$). Because the majority of the HA sample group was under the age of 26, scores on the RSES for HA

participants ranging in age from 18 to 25 were compared to normative data from this same age group (Sinclair, et al., 2010). The average RSES score for HA participants in this age group was 21.08, while the normative score for this group is 19.67. When compared only to age-matched peers, as opposed to others from the United States population as a whole, scores for HA dancers were significantly higher ($t(70) = 2.163, p < .05$)

The relationships among several variables in the HA and PD samples were explored using Pearson correlations. Results for the HA sample are presented in Table 7 and results for the PD sample are presented in Table 8.

Table 7: Pearson Correlations (HA dancers)

| | RSES | PANAS Pos | PANAS Neg | PSDQ | Self-Eff | QoL | Age | Educ |
|---------------|---------------------|--------------------|-----------|--------|--------------------|---------|--------------------|--------------------|
| PANAS Pos | 0.237* | | | | | | | |
| PANAS Neg | -0.385 ⁺ | 0.048 | | | | | | |
| PSDQ | 0.206* | 0.198 | -0.107 | | | | | |
| Self-Eff | 0.664 ⁺ | 0.287 ⁺ | -0.233* | 0.244* | | | | |
| QoL | 0.537 ⁺ | 0.260* | -0.161 | 0.096 | 0.743 ⁺ | | | |
| Age | 0.217* | 0.016 | -0.223* | -0.094 | -0.064 | -0.150 | | |
| Educ | 0.218* | -0.072 | -0.210* | -0.161 | -0.029 | -0.213* | 0.601 ⁺ | |
| Years Dancing | 0.176 | 0.055 | -0.199 | 0.050 | 0.048 | -0.064 | 0.769 ⁺ | 0.496 ⁺ |

* $p < .05$, ⁺ $p < .01$

PANAS Pos: *International Positive and Negative Affect Schedule - Short Form, Positive Affect Subscale*; PANAS Neg: *International Positive and Negative Affect Schedule - Short Form, Negative Affect Subscale*; PSDQ: *Perceived Support from Dance Questionnaire*; Self-Eff: *Self-Efficacy Scale*; RSES: *Rosenberg Self-Esteem Scale*; QoL: *Quality of Life*

Table 8: Pearson Correlations (PD dancers)

| | PANAS Pos | PANAS Neg | Self-Efficacy | ADLs | QoL | Age |
|---------------|--------------------|-----------|--------------------|--------|---------|-------|
| PANAS Neg | -0.281 | | | | | |
| Self-Efficacy | 0.78 ⁺ | -0.251 | | | | |
| ADLs | 0.509 ⁺ | -0.385* | 0.696 ⁺ | | | |
| QoL | 0.179 | -0.006 | 0.464 ⁺ | -0.035 | | |
| Age | -0.077 | -0.136 | -0.354 | -0.328 | -0.347* | |
| Education | -0.12 | 0.075 | -0.097 | 0.011 | -0.273 | 0.043 |

* $p < .05$, ⁺ $p < .01$

PANAS Pos: *International Positive and Negative Affect Schedule - Short Form, Positive Affect Subscale*; PANAS Neg: *International Positive and Negative Affect Schedule - Short Form, Negative Affect Subscale*; QoL: *Quality of Life*

Quantitative Analyses

Participants in both HA and PD groups were asked whether or not they believe dance helps them to feel better, and, if so, how long they believe the effects last. All 96 of the HA participants indicated that they believe dance helps them to feel better (Table 9a). Of the PD dancers, 60 (98.4%) reported that they experienced benefits as a result of dance classes, while 1 (1.6%) reported that he/she experienced no benefits (Table 9b). Full results regarding the lengths of time that participants in each group believe the benefits of dance last are also presented in Tables 9a and 9b. Unfortunately, "a lifetime" was removed as an answer choice for PD dancers prior to distribution of the survey.

Table 9: Perceived Benefits of Dance

9a:HA Dancers

| Benefits? | Number | Percent |
|-------------------------|--------|---------|
| Yes | 96 | 100.0 |
| No | 0 | 0.0 |
| How long? | Number | Percent |
| Until the Class is Over | 2 | 2.1 |
| For a Few Hours | 18 | 18.8 |
| For a Few Days | 13 | 13.5 |
| Until the Next Class | 4 | 4.2 |
| A Month | 0 | 0.0 |
| A Lifetime | 54 | 56.6 |
| I Don't Know | 5 | 5.2 |
| No Response Given | 0 | 0.0 |

9b: PD Dancers

| Benefits? | Number | Percent |
|-------------------------|--------|---------|
| Yes | 60 | 98.4 |
| No | 1 | 1.6 |
| How long? | Number | Percent |
| Until the Class is Over | 14 | 23.0 |
| For a Few Hours | 9 | 14.8 |
| For a Few Days | 21 | 34.4 |
| Until the Next Class | 7 | 11.5 |
| A Month | 1 | 1.6 |
| I Don't Know | 7 | 11.5 |
| No Response Given | 2 | 3.3 |

Analysis of Variance (ANOVA) was used to compare HA dancers and PD dancers on the three quantitative measures that were administered to both groups: nine items from the *International Positive and Negative Affect Schedule - Short Form* (I-PANAS-SF; Thompson, 2007), the self-efficacy questionnaire, and on a single item

assessing quality of life (Table 10). Results of analyses on the I-PANAS-SF indicated there was no difference between the two groups on the Positive Affect subscale, but the HA dancer sample scored higher on the Negative Affect subscale, indicating that the HA dancers reported experiencing higher levels of negative affect while dancing than their counterparts in the PD sample. Results of analyses on the self-efficacy questionnaire indicated that the HA dancers scored higher than the PD dancers on the total score. There was no difference between the two groups on the item assessing quality of life.

Table 10: ANOVA Results

| Measure | M(HA) | SD(HA) | M(PD) | SD(PD) | SS | F | Sig |
|---------------|-------|--------|-------|--------|----------|--------|--------|
| PANAS Pos | 21.63 | 2.30 | 20.88 | 3.80 | 18.000 | 2.17 | 0.143 |
| PANAS Neg | 7.89 | 2.16 | 5.77 | 2.17 | 141.737 | 30.273 | < .001 |
| Self-Efficacy | 50.79 | 6.82 | 40.81 | 12.49 | 1528.010 | 20.799 | < .001 |
| QoL | 4.06 | 0.87 | 3.84 | 1.05 | 1.654 | 1.902 | 0.170 |

PANAS Pos: *International Positive and Negative Affect Schedule - Short Form, Positive Affect Subscale*; PANAS Neg: *International Positive and Negative Affect Schedule - Short Form, Negative Affect Subscale*; QoL: Quality of Life

Participants in the HA dancer sample were also administered a social support questionnaire developed for the purposes of this study: the *Perceived Support from Dance Questionnaire* (PSDQ; Appendix D). The purpose of this scale was to specifically address social support received within the dance community, primarily from dance instructors and from other dancers. While other measures of social support are available, this one was developed to ensure that the results were based on dance participation and not on other possible sources of support. The scale was found to be reliable ($\alpha = .84$). Scores on this scale could range from 10 to 50. Actual scores from the HA sample ranged from 24 to 50, with an average score of 40.99. This suggests a moderate to high level of perceived social support. Unfortunately, because the scale was developed specifically for

this study and was not administered to the PD group, comparisons with other samples were not possible. Table 11 presents the items from the social support questionnaire rank ordered by how strongly each was endorsed.

Table 11: Social Support Results (HA Dancers)

| Item | Mean | St Dev |
|--|------|--------|
| I have made friends in my dance classes. | 4.57 | 0.722 |
| I believe other dancers would help me if I needed assistance | 4.41 | 0.705 |
| I feel supported by my dance teacher(s). | 4.33 | 0.592 |
| The dance studio is a supportive environment. | 4.18 | 0.808 |
| There is not much sense of community in my dance class* | 4.18 | 1.026 |
| When I have a problem, I can talk to other dancers about it. | 4.11 | 0.961 |
| I feel less lonely because of my participation in dance class. | 4.07 | 1.018 |
| I rarely get together with people I have met in dance class outside of class.* | 3.97 | 1.226 |
| I feel isolated from others in my dance class* | 3.82 | 0.995 |
| When I have a problem, I feel I cannot talk to my dance teacher(s) about it.* | 3.34 | 1.212 |

*These items were reverse scored

Additional information on the perceived effects of dance was obtained by providing participants with lists of prompts, and asking them to identify which of these items reflect their experiences. The lists of items were developed as part of a program evaluation study of DfPD®. PD dancers were presented with three such lists which were scored in a dichotomous manner, with participants endorsing those items that applied to them. The results are rank ordered from most to least commonly endorsed and reflect the number and percentage of participants who endorsed each item. The first list asked participants to identify which components of dance classes they found most valuable (Table 12). Of the options provided, the items most frequently endorsed as valuable were

“moving and getting some exercise” (70.5%), “doing something fun” (67.2%), and “music (live)” (65.6%).

Table 12: Benefits of Dance (PD Dancers)

| What parts of the class do you think are most valuable to you? | Number | Percent |
|--|--------|---------|
| Moving and getting some exercise | 43 | 70.5 |
| Doing something fun | 41 | 67.2 |
| Music (live) | 40 | 65.6 |
| Social interactions with other class members | 35 | 57.4 |
| Connections with the teacher(s); knowing someone is interested and cares | 35 | 57.4 |
| Doing something creative | 34 | 55.7 |
| Participating in a group activity with others | 34 | 55.7 |
| Being out of the house for a while and having someplace to go and something meaningful to do | 26 | 42.6 |
| Feeling physically “free” for a while | 26 | 42.6 |
| Chance to have positive interactions with a partner, spouse, friend or home attendant | 19 | 31.1 |
| Music (recorded) | 2 | 3.3 |

PD dancers were also asked to indicate what they found most challenging about participating in dance classes (Table 13). “Remembering movement sequences” (59.0%) and “following sequences of movement” (50.8%) were most often reported as challenging. Finally, participants were asked to identify what improvements, if any, their caregivers, or others, had noticed since they began participating in dance classes (Table 14). The most commonly reported improvements were "a more positive outlook" (29.5%), "walking more easily" (26.2%), and appearing to have "better balance" (26.2%). Additionally, 26.2% of participants indicated that they had received no feedback regarding perceived improvements from caregivers, and one person reported that others had overtly stated that they had seen no improvement.

Table 13: Challenges of Dance (PD Dancers)

| What, if anything, do you find particularly challenging about Dance for PD? | Number | Percent |
|---|--------|---------|
| Remembering the sequences of movements | 36 | 59.0 |
| Following sequences of movements | 31 | 50.8 |
| Doing a series of different movements in a set amount of time | 26 | 42.6 |
| Doing the exercises at the same speed as the instructor | 25 | 41.0 |
| The dance steps themselves | 22 | 36.1 |
| Being spontaneous during improvised exercises | 19 | 31.1 |
| Moving across the floor | 17 | 27.9 |
| Keeping my balance | 17 | 27.9 |
| Staying on the beat | 15 | 24.6 |

Table 14: Other-Reported Changes (PD Dancers)

| What changes have others (e.g., family members, physicians, physical therapists) observed since you began participating in Dance for PD classes? | Number | Percent |
|--|--------|---------|
| They say I am more positive in my outlook | 18 | 29.5 |
| They say that I walk more easily | 16 | 26.2 |
| They say I appear to have better balance | 16 | 26.2 |
| They say I have renewed interest in physical wellbeing | 13 | 21.3 |
| They say I am better coordinated | 11 | 18.0 |
| They say I have a renewed interest in creativity and the arts | 11 | 18.0 |
| They say I project more confidence | 8 | 13.1 |
| They say I perform activities of daily living more easily | 7 | 11.5 |
| I have not heard any comments about changes | 16 | 26.2 |
| They say they haven't seen any changes | 1 | 1.6 |

HA dancers were also asked about the benefits of dance. However, instead of using a dichotomous format, they indicated the degree to which each item is beneficial on a scale ranging from 1 ("not at all") to 4 ("a great deal;" Table 15). Interestingly, the two items most strongly endorsed by HA dancers were also the two most frequently endorsed

items among PD dancers: "moving and getting some exercise" ($M = 3.82$, $SD = 0.435$) and "doing something fun" ($M = 3.73$, $SD = 0.513$).

Table 15: Benefits of Dance (HA Dancers)

| Please indicate the number you think best describes how much you think dance helps each of the following* | Mean | SD |
|---|------|-------|
| Moving and getting some exercise | 3.82 | 0.435 |
| Doing something fun | 3.73 | 0.513 |
| Doing something creative | 3.70 | 0.564 |
| Feeling physically "free" for a while | 3.67 | 0.627 |
| Music | 3.58 | 0.592 |
| Being out of the house for a while and having someplace to go and something meaningful to do | 3.57 | 0.722 |
| Participating in a group activity with others | 3.37 | 0.715 |
| Connections with the teacher(s); knowing someone is interested and cares | 3.32 | 0.827 |
| Social interactions with other class members | 3.27 | 0.788 |

*scale ranged from 1 (not at all) to 4 (a great deal)

Finally, to assess how dance is related to the functioning of individuals with PD, the PD sample was given two measures that were specifically designed to assess changes related to PD symptoms. These measures were also developed as part of a program evaluation study of DfPD®. In particular, these items were designed to assess whether or not dance participation was associated with level of functioning in areas of daily life outside of dance class (e.g., does participation in dance class make getting around easier in other contexts?). The first scale (Table 16), which was highly reliable ($\alpha = .93$), addressed changes in participants' perceived ability to complete Activities of Daily Living (ADLs). The most strongly endorsed items were "integrate music and rhythm to get things done" ($N = 41$, $M = 3.73$) and "more confidence" ($N = 40$, $M = 3.70$). Results for all questions are presented in rank order in Table 16.

Table 16: PD Dancer ADLs

Instructions: Please rate the following statements based on how you think Dance for PD classes have affected activities that occur outside of the studio. *

| | Mean | SD |
|---|------|-------|
| Integrate music and rhythm to get things done | 3.73 | 1.285 |
| More confidence | 3.70 | 1.265 |
| More motivated to be active outside class | 3.68 | 1.254 |
| Think about posture during the day | 3.67 | 1.309 |
| Easier to get around house | 3.59 | 1.284 |
| Trust my balance more | 3.48 | 1.301 |
| Move more fluidly | 3.47 | 1.310 |
| Think about movement quality during the day | 3.40 | 1.374 |
| Think about movement images during the day | 3.31 | 1.379 |
| Several ADLs with more ease | 3.49 | 1.287 |
| At least one ADL with more ease | 3.49 | 1.362 |
| Not much effect on ADLs | 2.62 | 1.170 |

*scale ranged from 2 (Strongly Disagree) to 5 (Strongly Agree), plus 1 (Not Sure)

PD participants were also asked to rate how much participating in DfPD improved other physical and psychological factors related to PD. Results of this measure are presented in Table 17. The measure was found to have a high level of internal

Table 17: PD Dancer Symptom Changes

Instructions: Using the scale below and on the line before each item, please indicate the number you think best describes how much you think DfPD helps each of the following:*

| | Mean | SD |
|--|------|-------|
| Improves mood | 3.59 | 0.574 |
| Increases sense of well-being | 3.50 | 0.735 |
| Increases a sense of accomplishment | 3.45 | 0.709 |
| Helps me feel less isolated | 3.42 | 0.767 |
| Helps me focus on something besides PD for a while | 3.26 | 0.896 |
| Improves motor systems | 3.13 | 0.769 |
| Gives me a sense of freedom | 3.06 | 0.942 |
| Helps me feel like my pre-Parkinson's self for a while | 2.70 | 1.020 |

* scale ranged from 1 (not at all) to 4 (a great deal)

consistency ($\alpha = .88$). The most highly endorsed items were "improves mood" ($N = 49, M = 3.59$) and "increases sense of well-being" ($N = 50, M = 3.50$).

Qualitative Analyses

Qualitative analyses were conducted by identifying themes in the responses to open-ended questions. The intention behind asking these questions was to gain a fuller understanding of both the positive and negative perceived effects of participation in dance across several physical and psychological domains in participants' own words. The data were analyzed using Thematic Analysis as outlined by Braun and Clarke (2006). As this is an exploratory study, this analysis aims to provide an overview of the perceived effects of dance as reported by dancers. Additionally, analysis was based primarily on what was explicitly stated by participants, with very little interpretation of latent content. All coding was reviewed by a second researcher to establish inter-rater reliability. The second rater had been involved in five qualitative studies, and had worked as a consultant on several other projects, during the three years prior to her assistance with this project. The reviewers discussed differences in coding until a consensus was reached. Only those codes endorsed by more than one participant were included in thematic analyses. Consistent with the exploratory nature of this study, an inductive, or "bottom up," approach to theme generation was used. For ease of reading, typos and misspellings have been corrected, but no changes have been made to the meanings of the responses.

Healthy Amateurs: What Makes Dance Different from Other Forms of Exercise?

Both HA and PD dancers were asked to describe what makes the dance classes in which they participate different from other forms of exercise with which they have

experience. Six themes and 15 subthemes were identified in the responses of the 85 HA dancers who responded to this question (Table 18). The most frequently represented theme was that, unlike other forms of exercise, dance contains an Artistic Component ($N = 54$). Within this theme, three subthemes were identified: Creativity, Art, and Music.

Table 18: What Makes Dance Different? (HA Dancers)

| Theme | Subtheme | Number |
|-------------------------|-----------------------|--------|
| Artistic Component | | 54 |
| | Creativity | 25 |
| | Art | 21 |
| | Music | 8 |
| Cognitive Component | | 53 |
| | Mind/Body | 28 |
| | Self-Expression | 21 |
| | Mindfulness/Awareness | 4 |
| Emotional Component | | 35 |
| | Emotion Expression | 18 |
| | Freeing | 10 |
| | Fun | 7 |
| Interpersonal Component | | 14 |
| | Community | 7 |
| | Performance | 4 |
| | Storytelling | 3 |
| Structure | | 10 |
| | Discipline | 5 |
| | Developmental Process | 3 |
| | Challenge | 2 |
| Spiritual Component | | 7 |

The Creativity subtheme ($N = 25$) highlights the fact that dancers have the ability to contribute to the generation of new movement sequences, and in so doing, to express their own ideas. Some responses representative of this subtheme include "dance allows me to be both creative and goal oriented...there is a formula, but I am invited to break it

in creative and personal ways" and "the point of dance is not to work out your muscles like in other exercise classes but to use them to create something beautiful and/or meaningful, to go beyond yourself."

The Art subtheme ($N = 21$) represents the idea that dance contains aesthetic qualities that are not present in other forms of exercise. Responses representative of this subtheme are "it is an art...anyone can run or walk or jump, but not everyone can make it look beautiful" and "dance has an artistic element which gives it the ability to be more impactful." Finally, the Music subtheme ($N = 8$) indicates the unique relationship dancers have to music, as exemplified by responses such as "dancing requires a more active relationship with sound as dancers listen to and relate with music" and "not only do I have to shape my body, but I have to understand...how it is moving in relationship to time (usually related to music)."

The second theme, made up of three subthemes, reflects the idea that dance contains a Cognitive Component ($N = 53$). The most frequently endorsed of these, Mind/Body ($N = 28$), highlights the fact that dance requires the integration of mental and physical factors. Some of the responses that exemplify this category include "use of mind and body together...you are both an athlete and artist all at once;" "dancers may be asked to interpret metaphors and abstract ideas through their bodies in individual ways;" and "it works my body out, but challenges my brain." Another subtheme reflecting the cognitive component of dance is Self-Expression ($N = 21$), which emphasizes the ability of dancers to express internal thoughts and emotions through movement. Responses that illustrate this theme include "dance has more of a personal touch...you add a little bit of yourself to

every piece, combination, step you do;" "it allows me to be more expressive;" and "it is about expressing yourself and where you are in space in that specific moment." The final subtheme comprising the cognitive theme is Mindfulness/Awareness ($N = 4$), which suggests that dance requires concentration and attention to the present moment.

Responses in this subtheme include "it is a mindful practice that cultivates...body awareness" and "there is a different, almost more urgent sense of kinesthetic awareness."

The third theme that was identified reflects the idea that dance has an Emotional Component ($N = 35$). This theme is comprised of three subthemes, the first of which is Emotion Expression ($N = 18$). This subtheme highlights the ability of dancers to express emotions through movement, as indicated by responses such as "it's a way of letting my emotions out in a non-destructive way;" "pouring emotion into my movement;" and "the emotional catharsis of movement and music." The second subtheme is Freeing ($N = 10$), which is a word taken directly from respondents' answers. Responses in this subtheme include "dance engages feelings of creativity and freedom that you often do not get in other active classes" and "dance is freeing and allows for endless kinds of movement even if you're given specific moves." The final subtheme in this theme is Fun ($N = 7$), or the idea that dance is simply more enjoyable than other forms of physical activity. Some responses that exemplify this subtheme include "the amount of...fun I have while dancing" and "your movement is enjoyable...it doesn't feel like a workout."

The next theme highlights the Interpersonal Component ($N = 14$) of dance. The first subtheme, Community ($N = 7$), emphasizes that dancing with others fosters a sense of belongingness. Responses such as "In dance, I am simultaneously aware of myself and

those around me...there is a particular relationship that exists that is very different from other exercise courses" and "dance helps people of all backgrounds to find themselves and find community" are representative of this subtheme. Another subtheme is Performance ($N = 4$), which emphasizes the relationship that exists between performers and audience members. Examples of responses in this subtheme include "[dance] can be choreographed to music and performed" and "connecting with the audience and thinking about the quality of my performance." Finally, the Storytelling subtheme ($N = 3$) highlights the idea that, like other forms of artistic expression, dance can convey ideas or meaning. This subtheme is differentiated from the Self-Expression subtheme mentioned above in that storytelling implies communication, or the presence of a listener, while self-expression can be accomplished alone, in the same way that publishing a novel is different from writing in a personal journal. Storytelling is also different from Performance in that any dance conducted before an audience is a performance, but any one performance may or may not contain storytelling elements. Responses representative of this subtheme are "dance is less about 'doing it correctly' and more about expressing...an idea, or telling a story" and "I like to tell stories through my dance."

Another theme, Structure ($N = 10$), is indicative of the fact that the organization of dance training differs from other forms of exercise. The first subtheme, Discipline ($N = 5$), emphasizes how rigorous and technical dance training can be. For example, respondents stated "It is more disciplined...it also trains a person in a specific way;" "more attention and corrections, more pressure to execute movements perfectly than in recreational exercise;" and "it requires more discipline and focus." Another subtheme,

Developmental Process ($N = 3$), highlights that dancers learn and grow as they progress through their training. Responses typical of this theme include "dance forces you to be fully engaged at all times and develop simple steps into more difficult ones through class progressions" and "you do not just come in for one class and then you are done, you work with a teacher for a certain amount of time and progress throughout the time in class." The final subtheme, Challenge ($N = 2$), illustrates that participants find dance classes more difficult than other exercise classes in which they have participated, as indicated by responses such as "dance is so much more technical...and challenging, versus an exercise class which is there for one purpose only: physical activity" and "it can be a whole body work out; it is fun and challenging."

The final theme that was identified is that dance includes a Spiritual Component ($N = 10$). Several participants used the words "spiritual" and "spirituality" when describing how they see dance as different from other forms of exercise, and no subthemes were identified within this theme. Responses typical of this theme include "it is a spiritual experience;" "it differs from being on an elliptical because there is an intrinsic part of one's soul involved in dance, plus the history, philosophy, and cultural history of the dance is more invigorating and spiritual than just a machine in a gym;" and "the power behind dance comes from more than just physical ability and willingness, but an emotional and even spiritual drive."

PD Dancers: What Makes Dance Different from Other Forms of Exercise?

The five themes identified in the responses from PD dancers were all also found in the responses from HA dancers (Table 19). Thirty-six participants responded to this

question. The only difference found between the two groups at the theme level was that the PD dancers made no reference to a spiritual component of dance. Additionally, many of the identified subthemes were present in both groups. In the PD sample, as in the HA sample, the most commonly-endorsed theme was that dance contains an Artistic Component ($N = 18$). The most common subtheme in this theme for this sample group was that Music makes a difference ($N = 14$). Examples of responses in this subtheme include "the live music is especially freeing" and "the music helps me to move more smoothly." Another subtheme was Creativity ($N = 2$), which is exemplified by responses such as "framework of class is more creative," and suggests that dance classes allow for more creative expression than other forms of exercise. The final subtheme under this theme suggests that dance is Art in addition to exercise, as represented by responses such as "it's Carnegie Hall compared to Bellevue Hospital" ($N = 2$).

Table 19: What Makes Dance Different? (PD Dancers)

| Theme | Subtheme | Number |
|--------------------------------|------------------|--------|
| <u>Artistic Component</u> | | 18 |
| | Music | 14 |
| | Creativity | 2 |
| | Art | 2 |
| <u>Interpersonal Component</u> | | 17 |
| | Teachers | 10 |
| | Community | 7 |
| <u>Emotional Component</u> | | 6 |
| | Fun | 6 |
| <u>Structure</u> | | 6 |
| | Movement Quality | 6 |
| <u>Cognitive Component</u> | | 2 |
| | Mind/Body | 2 |

The next theme, the Interpersonal Component ($N = 17$), emphasizes the ability to form relationships through participation in dance classes with teachers and other members of the dance community. The first subtheme, Teachers ($N = 10$), emphasizes the important role that supportive teachers play in a positive dance experience. This subtheme is highlighted in responses such as "the instructors are very knowledgeable about their bodies and very subtly help us to exercise all parts of our bodies and make home practicing easier;" "the staff...believe dance can help people with PD and take that and us seriously;" and "do not underestimate the impact of the personalities of the teachers...[they] are exceptional teachers as well as world-class dancers." The other subtheme within this theme is Community ($N = 7$), which describes the importance of members of the dance community who are not instructors, including other members of the class and volunteers. Responses representative of this subtheme include "club like' feeling to the group;" "continuity of relationships with peers;" and "a group with other people who have Parkinson's."

The next theme, Emotional Component, had one subtheme: Fun ($N = 6$). This subtheme emphasized the idea that dance classes are more fun or enjoyable than other exercise classes, through such responses as "more dancing, not pure exercise...more fun" and "given with much joy." The subtheme identified within the theme of Structure was that of Movement Quality, which highlights the fact that the style of movement employed in dance classes differs from other forms of exercise ($N = 6$). This is exemplified by responses such as "it reminds me of interpretive dance classes with constraints on the type of movements involved." Finally, some participants identified a Cognitive

Component to dance through the Mind/Body subtheme, though the number of participants endorsing this subtheme in the PD dancer sample was much lower than in the HA dancer sample ($N = 2$). As in the other sample, this subtheme emphasizes the necessity of concurrent mental and physical engagement, and is found in responses such as "challenge and stimulation of remembering patterns."

Healthy Amateurs: What, if anything, do you dislike about dance classes?

HA dancers were also asked to identify what aspects of dance classes, if any, they do not like. Seventy-nine participants responded to this question. Five themes and 13 subthemes were identified in the responses from participants (Table 20). The most frequent theme endorsed by participants was Intrapersonal ($N = 42$). Four subthemes comprise the Intrapersonal theme: Self-criticism, Perfectionism, Body Image, and Capability. The first of these, Self-criticism ($N = 23$), refers to dancers' tendency to be harshly critical or judgmental of themselves and their abilities. Responses representative of this subtheme include "dancers...are very self critical and that could be damaging to the self esteem...we stare at ourselves in the mirror every day, and all we do is pick out all of the things that are wrong with us;" "when other people are better than me and I'm struggling with the choreography, that makes me feel like I'm not good enough and sometimes I leave feeling worse than when I started;" and "the judgmental feelings that come from you as you watch yourself, it's hard to get rid of those overly judgmental thoughts that aren't necessary." Five participants directly addressed the presence of mirrored walls in dance studios and the role that these play in encouraging self-criticism.

Table 20: What, if anything, do you dislike about dance classes? (HA Dancers)

| Theme | Subtheme | Number |
|--------------------|----------------|--------|
| Intrapersonal | | 41 |
| | Self-criticism | 23 |
| | Perfectionism | 7 |
| | Body Image | 6 |
| | Capability | 5 |
| Interpersonal | | 40 |
| | Bad Teachers | 13 |
| | Competition | 11 |
| | Pressure | 8 |
| | Criticism | 5 |
| | Other Students | 3 |
| Structural Factors | | 19 |
| | Structure | 16 |
| | Access | 3 |
| Physical | | 5 |
| | Exhaustion | 3 |
| | Injury | 2 |
| Nothing | | 3 |

The second subtheme under the Intrapersonal theme is Perfectionism ($N = 7$).

This subtheme highlights the idea that HA dancers often strive for unattainable perfection. Responses in this category include "occasionally, I become obsessively perfectionistic about things;" "sometimes I feel we strive for perfection...this bothers me because I will never be that;" and "I'm a perfectionist; if I make a mistake or know that I can do better, I start feeling bad about myself." The third subtheme in this category is Body Image ($N = 6$), which underscores the pressure dancers sometimes feel to attain or maintain a very specific body shape. Responses falling into this subtheme include "like every other teenage girl, I have certain things that I don't like about my body, and for a short time, I considered quitting dance because I just felt like I would never measure up

to the thin, stretchy women I observed at professional ballet companies...when I looked in the mirror and compared my body with the girls dancing around me, I felt terrible;" "sometimes it promotes a negative body image;" and "sometimes ballet class makes me hate myself because I will never have the perfect ballet body." The final subtheme within this theme is Capability ($N = 5$), or the frustration that arises when choreography is beyond a dancer's ability level. Some responses that exemplify this subtheme are "sometimes pace of introducing new material is too fast and I haven't had a chance to learn and thoroughly enjoy the movement - struggle with complicated sequence;" "I struggle to get things quickly, so that can be embarrassing;" and "not being able to do all the moves."

The second most commonly-endorsed theme was Interpersonal ($N = 40$), which addresses difficult situations that can arise between the various parties involved in a dance class. The first subtheme within this theme is Bad Teachers ($N = 13$), which highlights the important role teachers have in ensuring that dance classes are fun, educational, and safe. Some responses that exemplify this subtheme include "some dance teachers put such a pressure to become a carbon copy of what we feel is the ideal when in reality, everyone who dances has unique qualities that make them special and important to the world of dance;" "in dance class, no matter how much teachers want to try to be unbiased, there are always favorites and that makes you feel bad too, and when you do get attention, it is usually a correction or scolding, which makes you feel just as bad;" and "if the teacher is on autopilot and doesn't accommodate class needs or abilities."

The second subtheme is Competition ($N=11$), which refers to the competitive atmosphere that can arise between students in a dance class or company. Responses such as "in some, not all, there is a competitive atmosphere amongst the students in order to be the best, get noticed, and be liked by the teacher;" "it can also become competitive when people don't get certain dancing roles;" and "sometimes there is added competition between the other dancers which doesn't make dance as enjoyable" are typical of this subtheme.

The third subtheme within the Interpersonal theme is Pressure ($N = 8$), which refers to the stress placed on dancers by others. Responses representative of this subtheme include "some classes have expectations derived from an unrealistic, ingenuine, superficial place;" "the judgment or pressure I feel from other students sometimes;" and "pressure to be perfect." The fourth subtheme within this theme is Criticism ($N = 5$), or receiving negative feedback from others. "Negative atmospheres in class rooms where people are treated with a scarring amount of disrespect that make people feel worse about themselves and nervous to be in the classroom instead of giving them the confidence they need to experience dance for themselves instead of what someone else is expecting of them;" "taking something that I love and having to put a grade on it;" and "it constantly feels like everyone else is judging you" are examples of responses in this subtheme. The final subtheme within the Interpersonal theme is Other Students ($N = 3$). This subtheme describes hurtful social dynamics that can arise within a group of dancers. Responses that reflect this subtheme are "sometime the girls in dance can be petty and mean...there are a

lot of groups or cliques and there can be social drama" and "sometimes there are cliques in dance or there are groups that are formed that some people are not included in."

The third theme, Structural Factors ($N = 19$), addresses concerns related to how classes are organized and the barriers that can prevent dancers from participating in classes to the degree that they would like. The first subtheme within this theme is Structure ($N = 16$). Many responses in this category addressed class length and class size, such as "I wish they were longer because I love them, and if they were longer, there could be more time for a cool down and warm up stretches" and "if classes are overcrowded, I dislike having to compete with others for one-on-one feedback from instructors and for space to move and travel." Others addressed the pacing of classes: "if the class moves too fast or too slow, if the class is too technical without enough time for choreography or more fun stuff." Another aspect of dance that some participants reported disliking is the requirement to take classes in styles that may not appeal to the dancer. Some such responses were, "I hate when I have to take a dance class in a style I do not enjoy" and "I often take classes that are required and I do not like the movement." The other subtheme within the theme of Structural Factors is Access ($N = 3$). This subtheme, exemplified by responses such as "there are not enough adult dance classes outside of NYC;" "that there aren't more available to my age group;" and "they can be expensive" highlight the difficulty of maintaining dance as a hobby due to the dearth of classes available for dancers over the age of 18 and the high cost of attending the few classes that are available.

The fourth theme, Physical ($N = 5$), addresses the impact of dance participation on the body. The first subtheme within this theme is Exhaustion ($N = 3$), which highlights the physical strain that can result from regular dance participation. One participant elaborated that "dance can also cause exhaustion and stress because training is extremely time consuming and physically demanding," while others simply wrote the word "exhaustion." The other subtheme within this theme is Injury ($N = 2$), which addresses the wear and tear that occur over time as a result of dancing. One participant responded "can be damaging to the body," while another merely wrote "injuries." The final theme that emerged is Nothing ($N = 3$). The three responses in this category consisted of simply the word "nothing," indicating that there are no aspects of dance participation that these respondents disliked.

PD Dancers: What, if anything, do you dislike about DfPD?

PD dancers were also asked to discuss any aspects of dance participation that they disliked. They were prompted with: "What, if anything, do you not enjoy about DfPD? What would you like to change about the class?" Thirty-three participants responded to this question. As with the previous question regarding what makes dance classes different from other exercise classes, the themes that emerged among the responses given by the PD dancers were similar to those that emerged from the responses given by the HA dancers. One primary difference was that fewer themes and subthemes emerged from the PD group (Table 21). The themes identified were Structural Factors, Nothing, and Interpersonal.

Table 21: What, if anything, do you not enjoy about DfPD? What would you like to change about the class? (PD Dancers)

| Theme | Subtheme | Number |
|--------------------|-----------|--------|
| Structural Factors | | 25 |
| | Structure | 14 |
| | Difficult | 7 |
| | Access | 4 |
| Nothing | | 9 |
| Interpersonal | | 2 |

The most frequently-endorsed theme was Structural Factors ($N = 25$). The first subtheme within this theme is Structure ($N = 14$). As with the healthy amateur dancers, this subtheme highlights difficulties that arise due to the way classes are organized. Responses typical of this subtheme are "I do not like when we split the class...it's just fun to be with everyone together;" "I'd like the class to begin on time;" "sometimes it is difficult to hear the instructors' voices above the music, they need to talk much louder;" and "I would like more floor exercises." The second subtheme within this theme is Difficult ($N = 7$). Responses within this subtheme, such as "more routines which are flowing and easier to follow and remember ...more awareness of difficulties posed by PD;" "don't like sequences of modern, abstract movements detached from a story, or sequences which are too long...it's too hard for us to remember with our diminished short-term memories;" and "it frequently goes too fast for me, then I get anxious and can't do some of the movements at all" highlight the fact that dance is not easy, particularly for individuals with memory challenges or movement disorders, both of which are true in PD. It is worth noting that PD dancers who expressed an inability to complete steps generally attributed this to external factors, such as the structure of the class (e.g., moving

too fast, not enough repetitions), whereas the amateur dancers who described difficulty completing steps exhibited a tendency to attribute this to internal factors, like ability level. The final subtheme within the theme of Structural Factors is Access ($N = 4$), which, as with the amateur dancers, addresses the wish that more classes were readily available. Examples of responses within this subtheme include "too far from home; difficult to get to;" "I would like to attend more frequently;" and "want more, not less."

The second most common theme was Nothing ($N = 9$). These responses express the view that there are no aspects of DfPD classes that should change. Responses that exemplify this theme include "it is perfect, cannot think of changing anything;" "nothing to change, it is a great concept;" and "I would not change a thing."

The final theme identified is Interpersonal ($N = 2$). This theme addresses unpleasant situations that can arise between the various parties involved in DfPD. Responses within this theme are "I don't like volunteers who try to almost professionalize sympathy" and "when I'm with other participants, I fear that I am looking at my future."

Healthy Amateurs: Does dance help you to cope? Tell me more about it.

HA dancers were also asked to describe if and how they believe dance works as a coping strategy. In response to the screening question asking "Does dance help you to cope?," 6 participants answered "no" and 90 answered "yes." Of the 90 who answered in the affirmative, 79 answered the open-ended follow-up question. Five themes were identified within their responses: Cognitive, Emotion-focused, Physiological, Traits, and Environment (Table 22).

Table 22: Does dance help you to cope? Tell me more about it. (HA Dancers)

| Theme | Subtheme | Number |
|-----------------|--------------------------|--------|
| Cognitive | | 37 |
| | Distraction | 32 |
| | Mindfulness/Awareness | 5 |
| Emotion-focused | | 36 |
| | Self-expression | 15 |
| | Catharsis | 8 |
| | Emotion Transformation | 7 |
| | Emotion Processing | 6 |
| Physiological | | 12 |
| | Relaxation/Stress Relief | 9 |
| | Endorphins | 3 |
| Traits | | 9 |
| | Self-esteem | 4 |
| | Perseverance | 3 |
| | Freedom | 2 |
| Environment | | 6 |
| | Safety | 4 |
| | Social Support | 2 |

The Cognitive theme ($N = 37$) highlights the role that mental processes play in coping. The first subtheme identified within this theme was Distraction ($N = 32$). This subtheme emphasizes the use of dance as a way for HA dancers to take their minds off life stressors. Responses such as "no matter what is going on in my life, I have to leave it at the door when I go to dance...while I'm in class I don't have time to think about anything but dance;" "if you are struggling with something beforehand, you can take a class, and then come back to the problem afterwards with a fresh start;" "if you want to improve in dance, you must focus with every ounce of attention you have, there's no room for thinking about life's troubles...the music captivates you, and you find yourself lost in time;" and "when I am in the dance studio, I am in that present moment, with all of

my other cares, to-dos, and worries not bothering me at that time" are representative of this subtheme.

The other subtheme identified within this theme was Mindfulness/Awareness ($N = 5$). This subtheme highlights the benefit of focusing attention on the body. While responses in the Distraction subtheme often addressed focusing on the body, those responses described the benefit as stemming from taking a break from thinking about other things, whereas responses in this subtheme were related to deriving benefit from bodily awareness in and of itself without mention of a distraction component. Examples include "I focus on my breath and the movement and what my body is doing;" "I oftentimes have absolutely terrible days, then I walk into my modern dance class and become in tune with my own body again;" and "it helps me...become more in tune with my body and myself."

The second theme, Emotion-focused ($N = 36$), consists of coping skills that focus almost exclusively on emotions. The first subtheme within this theme is Self-expression ($N = 15$), which highlights the ability of HA dancers to express emotions through dance. Responses within this subtheme include "dance is my way of talking...I struggle with words so having another way to interpret how I am feeling is extremely helpful for me;" "being able to tell someone an experience without sharing words, to let go of anger and stress;" and "I enjoy expressing myself through movement; whatever I am feeling translates through the energy in my body." The next subtheme within this theme is Catharsis ($N = 8$). This word was chosen because it was used by participants to describe their experiences with large releases of emotion, and not because of its use in clinical

parlance. Responses that are representative of this category include "catharsis, a release of emotional and physical pain;" "I took an adult contemporary class when dealing with PTSD - I signed up just to get some peace time away from home and found it helped me release a lot of anger and sadness;" and "dance is what has pulled me out of the worst depression I have ever been in. It is the one thing that helps me release my grief from immense amounts of loss I have experienced throughout my life and other hard things I am going through...I definitely consider dance as a form of release and a way to cope with everything else that is going on in my life."

The third subtheme within the Emotion-focused theme is Emotion Transformation ($N = 7$). Responses in this category describe emotions changing during the course of a dance class. "Dancing when I feel sad makes me feel happy;" "my mood is always better after doing or seeing dance;" and "sometimes, when I have a bad day, I go to the dance studio late at night and dance my heart out so that I feel happy inside" are exemplary of this subtheme. The final subtheme within this theme is Emotion Processing ($N = 6$). These responses indicate that HA dancers use dance to work through their emotional experiences in a different way. Responses within this category are "dance helps center me again and gives me an outlet to process my emotions without stress, pressures, or complications;" "I find that dancing helps to "re-order" my mind, in a sense, allowing me to have a new and more relaxed approach to problems I might face;" and "dancing can help me work through the problem by just letting my emotions show through my movement... there's just something about reaching or turning or simply walking across

the floor that lets me 'act out' my problems; I may not solve any issues during a dance class, but I definitely have a clearer mind about things when I leave the floor."

Another theme that was identified in response to this question was Physiological ($N = 12$). The first subtheme within this theme is Relaxation/Stress Relief ($N = 9$), which emphasizes the impact that feeling physically relaxed or at ease can have on emotional state. Responses typical of this subtheme include "in the simplest form, dance is exercise which helps calm me, release stress, and focus my mind for the rest of the day;" "I love to tap and there is something calming about getting lost in the rhythms;" and "the after-effects of a dance session are calming." The other subtheme within this theme is Endorphins ($N = 3$), which refers to positive physical feelings that can result from dancing. Examples of responses in this subtheme are "it also helps me get warm and relax my muscles...endorphin levels go up in a dance class, so I feel a little happier and more energized" and "gets your endorphins going."

The fourth identified theme was Traits ($N = 9$). Responses within this theme suggest that dance participation strengthens beneficial personality traits. The first subtheme within this theme is Self-esteem ($N = 4$), which highlights the idea that dance participation has helped HA dancers to feel more confident. Some of these responses are "dance has given me confidence in myself;" "an adult contemporary class... really boosted my self-esteem;" and "it makes me feel like I am an artist, that I have something I can contribute to the world." The next subtheme is Perseverance ($N = 3$). These respondents indicated that dance helps them to keep going when stressors arise. The responses within this subtheme were "I have faced childhood physical and psychological

trauma, and without dance I don't think I would be the persevering person I am today...dance has given me purpose, direction, motivation;" "dance has helped me persevere through difficult situations;" and "I feel that I'm better able to handle whatever it is that's bothering me, if I danced that day." This theme's final subtheme is Freedom ($N = 2$), or feeling unrestrained by stressors. Responses within this subtheme are "I struggle with bipolar depression and it gives me an outlet to feel free and uninhibited by my sadness and grief" and "it's freedom."

The final theme identified from responses to this question was Environment ($N = 6$). This theme identifies aspects of the dance setting that are conducive to effective coping. The first subtheme within this theme is Safety ($N = 4$). This subtheme underscores that dance can provide a protected and comforting space for managing difficult emotions. Some of the responses within this subtheme are "It's something that I can control...I can let everything out in my dancing or I can be as timid as I want, but I have that choice to feel the way I want to feel in a dance class even if I can't do that outside of a dance class;" "it gave me a safe place to develop physically, mentally and emotionally outside my public school and home; it was a safe place to experiment, fall and get up to try it again;" "it's familiar to me and gives me a sense of comfort;" and "it has always been my safe and sacred space when things outside the studio are not so great." The other subtheme identified within this theme was Social Support ($N = 2$), which emphasizes the role that having other supportive people around can play. The responses in this subtheme are "usually if I'm having a rough day, I know I am able to spend some time with people I

enjoy being around" and "the feeling of collaboration between students in dance classes forms strong friendships."

Healthy Amateurs: Do you experience physical effects?

The final open-ended question asked HA dancers to describe the positive and/or negative physical effects of dance participation. Participants were prompted with "Do you experience physical effects, either positive or negative, from your participation in dance?" Ninety-five participants responded "yes" and one responded "no." Of those who answered in the affirmative, 81 responded to the follow-up prompt "tell me more about them." The most common theme identified from the responses was Positive Effects ($N = 84$; Table 23). The most frequently-endorsed subtheme within this theme was Fitness ($N = 35$). This subtheme suggests that participation in dance classes increases strength and

Table 23: Do you experience physical effects, either positive or negative, from your participation in dance? Tell me more about them. (HA Dancers)

| Theme | Subtheme | Number |
|-----------------------|-------------------|--------|
| Positive Effects | | 84 |
| | Fitness | 35 |
| | Flexibility | 14 |
| | Heath | 11 |
| | Energy | 9 |
| | Awareness | 5 |
| | Endorphins | 5 |
| | Balance | 3 |
| | Weight Management | 2 |
| Positive and Negative | | 29 |
| | Soreness | 18 |
| | Exhaustion | 11 |
| Negative Effects | | 27 |
| | Injury | 20 |
| | Wear and Tear | 5 |
| | Illness | 2 |

overall physical fitness. Responses representative of this subtheme include "I feel like I'm probably in the best shape of my life;" "I feel/look stronger;" "it developed a very strong and lean physique that could do much more than most athletes I had met;" and "physically I am fit and strong." The second subtheme is Flexibility ($N = 14$), which highlights the improved range of motion that can result from training in dance. "Dance makes the body more flexible, which is important for physical health and preventing injury in other types of exercise;" "I feel myself getting...more flexible;" and "increased flexibility" are responses typical of this subtheme.

The third subtheme within the theme of Positive Effects was Health ($N = 11$). This subtheme differs from the Fitness subtheme in the Fitness subtheme addressed general strength and physical well-being, whereas the Health subtheme addressed benefits to specific bodily systems, such as circulation and respiration. Responses within this subtheme included "it keeps me healthy, my cardio stays up;" "deeper breathing;" and "it helps me stay...healthy, and feeling well." The next subtheme within this theme is Energy ($N = 9$), which describes feelings of renewed vigor, and is exemplified by responses such as "dance is rejuvenating;" "I feel invigorated afterwards;" and "I feel...more energized." Another subtheme that was identified is Awareness ($N = 5$), which emphasizes the ability of dance to help dancers become more in tune with their bodies. Responses within this subtheme include "connection to one's self and one's own body;" "it also helps with overall body awareness;" and "knowledge and understanding of your body and what it can do."

The sixth subtheme within the Positive Effects theme is Endorphins ($N = 5$), or the good feelings that can result from physical exertion. The responses within this subtheme include "the endorphins it gives you," "warm flushed feeling (in a good way)," and "after I really dance, where I involve my whole body, I feel much looser and relaxed physically." The next subtheme indicates that dance participation can result in improved Balance ($N = 3$). "My balance improves;" "my body feels...balanced;" and "I am...coordinated" are the responses within this subtheme. The final subtheme highlights dance's ability to assist with Weight Management ($N = 2$), as indicated by responses such as "weight loss is positive" and "a positive physical effect I experience from dance is being able to maintain my weight by matching my caloric intake with my caloric output provided by dance."

The second theme that was identified is Positive and Negative ($N = 29$). The subthemes within this theme are effects that were classified as negative by some respondents and positive by others, or as both positive and negative within the same response. The first subtheme within this theme is Soreness ($N = 18$). This subtheme encompasses minor aches and pains, such as muscle ache, that are not the result of an acute injury. Responses that exemplify this subtheme include "at my age, I sometimes hurt from trying to do too much;" "sometimes negative because it can be difficult and I become sore;" "the pain and muscle aches are usually a good feeling;" and "my body aches frequently, but I would not say it is a negative effect; it is positive." The other subtheme that fits within this theme is Exhaustion ($N = 11$), which describes feeling physically depleted after dancing. "Muscle exhaustion is one of the most satisfying

feelings in the world;" "I also feel happier when I am a little exhausted from dancing;" "it causes chronic exhaustion;" and "another negative physical effect is my body feeling exhausted, possibly due to my muscles being overworked" are responses typical of this subtheme.

The final theme identified in response to this question is Negative Effects ($N = 27$). The most frequently endorsed subtheme within this theme was Injury ($N = 20$). Responses representative of this subtheme include "I had knee surgery last fall;" "sometimes the body is pushed past to the point...injuries occur;" and "it can bring about certain injuries which are not fun to deal with." Another subtheme within this theme is Wear and Tear ($N = 5$). This subtheme differs from the Injury subtheme because it addresses minor damage that accumulates over time, as opposed to more severe and acute injuries. "It can take a toll on the body at times;" "it is also hard on the muscles and joints when done at high levels;" and "wear and tear" are responses typical of this subtheme. The final subtheme within this category is Illness ($N = 2$). Responses within this subtheme describe the impact that dance can have on specific health diagnoses, such as "the only negative effect that I sometimes receive is bad asthma attacks" and "I've been diagnosed with hip osteoarthritis in my twenties...I've experienced piriformis syndrome with sciatica, related to dance training."

Summary

Chapter Four presented the results of quantitative and qualitative analyses of the data gathered as part of the current study. The results of the preliminary analyses were presented, followed by results of analyses of administered questionnaires, and, finally,

qualitative analyses of responses to open-ended questions. Independent samples t-tests were used to compare HA and PD samples to each other and to normative samples.

Analyses found no significant difference between HA and PD dancers with respect to positive affect, but that HA dancers scored higher on negative affect than PD dancers. Additionally, HA dancers scored higher on positive affect and lower on negative affect on the I-PANAS-SF than the general population as represented by the normative sample. HA dancers were also found to have higher levels of self-esteem than age-matched peers. Other potential effects of dance participation, such as physical effects and social support, were explored using measures developed for the purposes of this study. Finally, Thematic Analysis was used to identify themes and subthemes within the responses to open-ended questions. These questions specifically addressed what makes dance classes different from other exercise classes, what participants dislike about dance classes, the use of dance as a coping strategy, and any physical effects of dance participation.

Chapter Five will discuss in further detail the results presented in Chapter Four. Chapter Five will also address the limitations of this study, as well as implications and recommendations for future research.

Chapter Five

Discussion

This chapter will begin with a brief summary of the study, followed by a discussion of its overall findings. It will then address the limitations of the study, implications for future research and clinical work, and present concluding statements.

Summary of the Study

Dance has been a significant part of human society since the earliest tribal communities, and in that time it has taken on many forms and served countless purposes (Chaiklin, 2009). In recent years, researchers have begun to explore various psychological aspects of dance. Research in the area of neuroscience has deepened our understanding of the "mind-body problem" (Carlson, 2013). Additionally, preliminary investigations have found that dance may be related to improved emotional, physical, and social well-being, and may also be an effective strategy for coping with stress and improving self-esteem (Quiroga et al. 2010). Dance has also shown potential benefits for a number of presenting concerns, including Parkinson's disease (PD; Westheimer, et al., 2012; Hackney, Kantorovich, Levin, & Earhart 2007), diabetes (Murrock, Higgins, & Killon, 2009), obesity (Murrock & Gary, 2010), depression (Jeong, Hong, Soo, Park, Kim, & Suh, 2005), and anxiety (Erwin-Grabner, Goodill, Hill, & Von Neida, 1999; Lesté & Rust, 1990).

Previous studies have suggested several mechanisms that could play a role in the observed benefits of dance. These proposed mechanisms include increasing perceived social support (Freeman & Rees, 2010; Hackney, Kantorovich, & Earhart, 2007; Murrock, Higgins, & Killon, 2009; Westheimer, et al., 2015), improving affect and coping (Knestaut, Devine, & Verlezza, 2010; Leseho & Maxwell, 2010; Quiroga et al., 2010; Quiroga, Bongard, & Kreutz, 2009; Roth & Cohen, 1986; Westheimer, et al., 2012), positively influencing self-esteem (Annus & Smith, 2009; Quiroga et al., 2010; Strassel, Cherkin, Steuten, Sherman, & Vrijhoef, 2011), improving physical health (Hackney & Earhart, 2009a; Murrock & Gary, 2011; Quiroga et al., 2010; Verghese, 2006), providing an opportunity for creativity and self-expression (Coubard, Duretz, Lefebvre, Lapalus, & Ferrufino, 2011; Heiberger et al., 2011; Quiroga et al., 2010; Ravelin, Kylmä, & Korhonen, 2006), and improving quality of life (Hackney & Earhart, 2009a; Heiberger et al., 2011; Sandel et al., 2005; Strassel et al., 2011).

The purpose of the present study was to explore these proposed mechanisms of action by assessing the effects of dance, both positive and negative, for healthy amateur dancers and persons with Parkinson's disease (PD) in order to explore the similarities and differences between the two groups. The persons with PD were enrolled in the Dance for Parkinson's Disease® (DFPD) program (PD dancers). The healthy amateur dancers in the present study (HA dancers) are individuals who engage in dance-related activities on a regular basis (attending classes, performing, teaching, choreographing, etc.), but for whom compensation for such activities does not constitute the majority of their income.

Quantitative measures were used to assess the following variables: affect while dancing, self-esteem, quality of life, and social support. Additionally, open-ended questions provided qualitative information addressing the factors that make dance different from other forms of exercise, the aspects of dance classes that participants dislike or would like to change, the role dance plays as a coping tool, and the physical effects of participation in dance classes. The study specifically addressed the following questions:

1. How do healthy amateur and PD dancers compare to each other on measures of self-esteem, affect, social support, and quality of life?
2. In response to open-ended questions, how do healthy amateur and PD dancers describe the effects of dance?
 - a. In what ways, if any, are the responses of the two groups similar and different?

Discussion of Overall Findings

Preliminary analyses were conducted to determine whether HA dancers and/or PD dancers differed from normative samples on measures of self-esteem and affect. Unfortunately, the participants in the PD dancer sample were not given the *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965), and they were given an unstandardized version of the *International Positive and Negative Affect Schedule - Short Form* (I-PANAS-SF; Thompson, 2007). Therefore, only HA dancers could be compared with normative samples on these two measures.

On the RSES, the scores for HA dancers were not significantly different from the average for adults living in the United States. However, when only participants ranging in age from 18 to 25 (which was the majority of the sample [$N=71$], which had an average age of 24.08) were compared to age-matched peers, their scores were significantly higher than that of the normative group. In a large study establishing population norms for the RSES, self-esteem was found to roughly increase with age (Sinclair, et al., 2010). Because the average age of the HA sample falls within the youngest age bracket, it is likely that the age-matched analysis is a more accurate comparison than that using the entire United States sample. Based on this comparison, young adult HA dancers in this sample had higher levels of self-esteem than age-matched peers from the general United States population. Other studies, including a recent meta-analysis, have also found that participation in dance classes may result in increased self-esteem (Hős, 2005; Strassel, Dherkin, Steuten, Sherman, & Vrijhoef, 2011). This consistency across studies supports the proposition that dance participation is related to high self-esteem.

Scores from the HA dancer sample were also compared to normative sample on I-PANAS-SF scores (Thompson, 2007). Analyses indicated that HA dancers exhibited higher levels of positive affect and lower levels of negative affect than the general population. This is consistent with the results of several previous studies that also found that dance participation increased positive affect and decreased negative affect (Knestaut, Devine, & Verlezza, 2010; Leseho & Maxwell, 2010; Quiroga, Bongard, and Kreutz, 2009; Westheimer et al., 2015). As participants were asked to rate their affect while dancing, results suggest that dance participation leads to positive changes in affect.

Additionally, over half of the HA sample ($N = 54$) reported that the benefits of dance last "a lifetime," which suggests that these effects last well past the end of class and may carry over into other areas of life.

The primary research question explored the ways in which HA dancers and PD dancers compare to each other on various quantitative measures. On the I-PANAS-SF, no difference was observed between the two groups on Positive Affect. However, the HA dancer sample scored higher on the modified Negative Affect subscale consisting of four items. This suggests that dance participation was associated with high levels of positive affect for both HA and PD dancers, but that low levels of negative affect were more strongly related to dance participation among PD dancers than among HA dancers. One possible explanation for this is that the "climates" of the classes in which HA and PD dancers participate may be very different. For example, classes for HA dancers are likely more rigorous and include components such as correction and critique that are not present in PD dance classes. These differences could account for HA dancers endorsing higher levels of shame and nervousness while dancing than their PD counterparts. Another potential explanation is that PD dancers were less concerned by what they perceived to be the negative aspects of dance participation. These concerns may have appeared to be relatively insignificant compared to the more significant worries associated with managing PD.

On a measure of self-efficacy, HA dancers scored higher than PD dancers ($p < .001$) on the total score. This measure asked participants to rate their level of certainty that they can "develop more confidence," and "have a sense of achievement." It is likely

that this difference is related more to differences in physical ability than in differences between their respective dance classes. Interestingly, there was no difference between the two groups on the single item assessing quality of life. Thus, differences in sense of self-efficacy did not translate into differences in perceived quality of life. It is possible that learning to live with PD provided PD dancers with a different perspective on quality of life. As mentioned above, PD dancers may have viewed their quality of life as less impacted by factors that, when compared to PD, appear to be relatively minor concerns, but that may be perceived as more significant concerns by HA dancers. Additionally, although comparisons to the general population were not made as part of this study, previous research found that dancers with PD and other clinical presentations reported increased feelings of independence (Westheimer et al., 2015), feelings of empowerment (Leseho & Maxwell, 2010), and improved quality of life (Bräuninger, 2012; Eyigor, Karapolat, Durmaz, Ibisoglu, & Cakir, 2009; Heiberger, et al., 2006) following dance class attendance. These factors may have also contributed to the lack of difference between HA and PD dancers.

Finally, both groups of dancers were asked to indicate how helpful they find various aspects of dance classes from a list of provided prompts. From this list, "moving and getting some exercise" and "doing something fun" were the two most strongly-endorsed items for both HA and PD dancers. After these first two items, responses to the lists diverged. It is also important to note that the lists given to the samples varied slightly. The version given to PD dancers included "music (live)" and "music (recorded)" as separate items, but these were collapsed into a single item "music" for the HA dancers.

Additionally, the item "chance to have positive interactions with a partner, spouse, friend or home attendant" was omitted from the version administered to HA dancers. These changes were made to reflect differences in the structures of dance classes, as having live musicians and bringing friends/partners to dance classes is uncommon in private studio or university settings.

Social interactions with peers and connections with teachers were of high importance to the PD dancers, while these were the two items ranked lowest by HA dancers. HA dancers, on the contrary, emphasized the importance of doing something creative and feeling physically "free." These differences are likely reflective of the differing goals behind the two types of dance classes. As a therapeutic intervention, one goal of Dance for PD® is to foster community and provide social support for individuals with PD. A primary goal of dance classes for HA dancers, on the other hand, is to foster artistic expression. In these classes, social support may be seen as more of a side-effect than a primary goal. Additionally, due to differences in mobility, HA dancers may have more opportunities outside of their dance participation to foster interpersonal relationships than do their PD dancer counterparts.

In addition to the quantitative measures administered to both groups of dancers, some measures were administered exclusively to one group or the other. The *Perceived Support from Dance Questionnaire* (PSDQ), measuring perceived social support gained from dance participation, was given only to HA dancers. The PSDQ was not administered to PD dancers because it was less relevant to the program evaluation goals of the Brooklyn Parkinson Group, and because lengthy surveys may have been difficult

for individuals with PD to complete. Responses to this measure suggested moderately high levels of perceived social support from peers and instructors in their dance classes. Although the average score was 40.99, there was a wide range of scores (24 to 50 with possible scores ranging from 10 to 50). Four of the 10 items were reverse-scored in order to decrease the likelihood of response bias.

This is an interesting finding given that, as discussed above, HA dancers did not endorse the social components of dance class as particularly important. This may further suggest that interpersonal connections in this context are seen more as a side-effect of dance participation as opposed to a primary goal. The fact that developing a sense of community seems to be a side-effect does not diminish the fact that it does still appear to happen. This finding is also consistent with previous findings that participation in dance classes promotes camaraderie and socialization, and these factors increase the likelihood of participants returning for further classes (Hackney, Kantorovich, & Earhart, 2007; Murrock, Higgins, & Killon, 2009; Westheimer et al., 2015).

Finally, several measures were given to only the PD dancers. The first of these explored the aspects of dance classes that PD dancers find challenging. The most frequently endorsed items related to being able to learn and recall sequences of movements, and to perform them quickly enough to stay on time. These difficulties may be related to possible dementia or to bradyphrenia, a form of mild cognitive impairment commonly observed in individuals diagnosed with PD that can result in deficits in attention, executive functioning, free recall, and visuospatial functioning (Kehagia, Barker, & Robbins; 2010). This finding is consistent with responses to the open-ended

question addressing what aspects of DfPD participants would like to change. Several participants expressed concern about their ability to learn new movement sequences at the pace at which they are taught, and to move with the music. Taken together, these results highlight the importance of tailoring movement and class speed to match the needs of participants. At the same time, however, making movement sequences overly simple may decrease the potential for growth. As such, it is important for instructors to pay attention to the balance between ease and difficulty of motion in order to maximize benefit and minimize frustration.

The other measures that were administered only to the PD dancers were designed to assess what impact, if any, dance participation has on PD symptoms. On a questionnaire exploring changes observed by others, many participants indicated that their caregivers had not reported any changes ($N = 16$). Among those whose caregivers had noted changes, the most common change was exhibiting a more positive outlook. Other commonly-reported changes included walking more easily and having better balance. These results are consistent with previous research, which has found that older adults (with or without a diagnosis of PD) who dance exhibit better balance and gait than those who do not dance (Hackney & Earhart, 2009; Kattenstroth, Kolankowska, Kalisch, & Dinse, 2010; Verghese, 2006). However, it is possible that relationship factors influenced responses to these items. For example, caregivers striving to be supportive may have exaggerated their observations of gain. Conversely, more isolated participants may have received no feedback related to observed changes, not because there have been no observable changes, but because of a lack of close friends or family available to make

such observations. In future studies, directly asking caregivers and/or physicians about observed changes could decrease the likelihood of relationship factors impacting responses.

Another measure was designed to assess the impact of dance participation on activities of daily living (ADLs). The most frequently endorsed item on this measure indicated that PD dancers are able to integrate music and rhythm into their lives outside of dance to help them with ADLs. This is consistent with another recent finding that individuals with PD who attend dance classes reported an increased ability to express themselves in a creative way (Heiberger et al., 2011). Other highly-endorsed items reflected increased confidence and increased motivation for physical activity. A final measure explored symptom changes. Responses to this questionnaire indicated that dance participation resulted in improved mood, increased sense of well-being, and increased sense of accomplishment. While the measures assessing self-reported changes and changes observed by others did not contain the same items, they both addressed similar domains, such as balance, ease of movement, and integration of music and creativity into life outside of dance class.

Taken as a whole, these results suggest that the perceived benefits of dance participation for PD dancers fall primarily within the psychological domain. PD participants reported that other individuals close to them had noted improvements in physical domains, such as balance and ease of walking, but PD participants themselves were more likely to emphasize improvements in mood, confidence, and sense of well-being. It is possible that dance participation has a more profound impact on psychological

functioning than on physical functioning, or perhaps minor gains in physical functioning are more apparent to others than to the PD dancers themselves.

The second research question explored the similarities and differences in how HA and PD dancers describe the effects of dance when prompted with open-ended questions. Participants in both groups were asked to describe what makes dance different from other exercise-based classes in which they have participated. The two groups shared five themes in common: Artistic Component, Cognitive Component, Emotional Component, Interpersonal Component, and Structure. However, the HA dancers also endorsed a sixth theme, Spiritual Component, which was not mentioned by participants in the PD dancer sample. This difference may be related to the fact that the dancers in the PD sample reported more difficulty learning and repeating movement sequences than dancers in the HA sample. The fact that the PD dancers must expend more effort to master the mechanical components of dance may not leave enough cognitive resources free to pursue the more aspirational and artistic components. It may also be that diminished cognitive capacity or slowed thinking contributes to difficulty learning new material.

Additionally, most of the subthemes identified in the responses provided by the PD dancers were also found in the HA dancer responses. However, the reverse is not also true. Many more subthemes were identified from the HA dancer responses, potentially because the size of the HA sample was much larger. Subthemes that were endorsed by HA dancers and not PD dancers were Self-Expression, Mindfulness/Awareness, Emotion Expression, Freeing, Performance, Storytelling, Discipline, Developmental Process, and Challenge. Many of these subthemes, such as Self-Expression and Emotion Expression,

reflect a level of artistic training that is not central to Dance for PD®. Other subthemes, such as Performance and Discipline, are also more representative of dance classes designed to prepare participants for potential careers in the performing arts than for those designed for individuals with PD.

The subthemes endorsed by PD dancers that were not endorsed by HA dancers were Movement Quality and Teachers. The emphasis on movement quality among PD dancers is understandable, as difficulty with fluid movement defines the diagnosis of PD. To have the opportunity to dance and move freely is not automatic for those with PD, but instead is a great gift. In regard to the importance of teachers among the PD group, teachers provide guidance and encouragement, and watch over the well-being and safety of the dancers. Teachers provide opportunities for fun, social interactions, and experiences that are often outside the relative isolation of the many who have PD. Additionally, DfPD teachers are clear that their classes are not designed to be a treatment. Their goal is simply to provide individuals with PD the opportunity to participate in dance. It is possible that having instructors who focus on dance, and not PD, is a welcome change from interactions with physicians. It provides participants with the opportunity to be treated as dancers and not as patients.

The other open-ended question asked of both HA and PD dancers addressed what, if anything, participants dislike about dance classes (HA dancers were asked what, if anything, they dislike about dance classes, while PD dancers were asked what, if anything, they do not enjoy about DfPD). The following themes were endorsed by participants in both samples: Structural Factors, Interpersonal, and Nothing. Two

additional themes were identified in the responses from the HA dancers: Intrapersonal and Physical. Again, it is likely that the higher number of themes and subthemes endorsed by HA dancers reflects the larger sample size for that group. The subthemes within the Intrapersonal theme were Self-criticism, Perfectionism, Body Image, and Capability. The lack of such themes within the responses from the PD sample likely reflects the differing pressures placed on the two groups. HA dancers are often expected to show progress (with an evaluative component in the case of university classes), perform, compete, and audition. No such demands are placed on PD dancers. Subthemes within the Physical theme were Exhaustion and Injury. It is also understandable why this theme was not endorsed by PD dancers. Dance for PD® was developed to provide the opportunity to experience the joy and fun of movement and dance, and participants are never pushed to attempt steps that are beyond their comfort level. HA dancers, on the other hand, are often pushed to the limits of their ability in order to perform and improve.

There were also several differences between the sample groups on themes that were endorsed by both. Both HA and PD dancers identified interpersonal concerns, but in very different ways. Only two PD dancers endorsed this theme, and they discussed unhelpful volunteers and pessimism when looking at other participants in the later stages of PD. Among the HA dancers, however, interpersonal concerns were commonly endorsed. Five subthemes emerged from these responses: Bad Teachers, Competition, Pressure, Criticism, and Other Students. It is interesting that, while HA dancers did not mention teachers when describing what makes dance different from other forms of exercise, this group did address teachers when discussing what they dislike about dance

classes. Responses from HA dancers that fall within this theme primarily addressed the way in which critical feedback is given, a culture of comparison and competition, and social dynamics that leave some dancers feeling isolated. Previous research also supports the idea that critical messages received from dance instructors can negatively impact dancers, and these messages are often related to poor body image and eating disturbance (Annus & Smith, 2009). It is reasonable to expect that such dynamics would not emerge in classes like Dance for PD®, which are designed to be cooperative and in which critical feedback is not a component.

In the theme of Structure, both HA and PD dancers largely addressed similar concerns, such as lack of access to desired classes and difficulties related to the format of the classes. One subtheme identified by PD dancers that was not endorsed by HA dancers was Difficult. Based on their responses, it appears that when PD dancers struggle to perform certain steps, they attribute this to the steps being too difficult. HA dancers, on the other hand, tended to attribute similar struggles to a lack of ability; an internal problem as opposed to an external problem. This difference could be related to the difference observed in self-efficacy between the two groups. If HA dancers perceive themselves to have a high level of control over their situations, then they may be more likely to hold themselves responsible when situations are not to their liking. PD dancers, on the other hand, may see themselves as having less influence of their situations, and thus view such difficulties as beyond their control.

Finally, there were participants in both groups who stated that there was nothing they disliked about dance classes. However, there were three times as many PD

participants who endorsed this view ($N = 9$) as HA participants ($N = 3$), despite the fact that the HA sample was much larger. One potential explanation for this finding is that HA dancers have participated in many dance classes over many years, and, therefore, have had more opportunities to experience adverse events. By contrast, PD dancers were asked to respond based exclusively on their experiences in DfPD classes. Another potential explanation is that DfPD classes have managed to avoid some of the pitfalls of other types of dance classes, such as unsupportive instructors and competition among dancers.

Two additional open-ended questions were asked only of participants in the HA sample. The first of these addressed in what ways, if any, dance helps HA dancers to cope. The themes identified within the responses were Cognitive, Emotion-focused, Physiological, Traits, and Environment. These results suggest that HA dancers can use dance as a coping tool in different ways. Based on Approach-Avoidance formulations of coping (Roth & Cohen, 1986), some of the coping strategies identified within the subthemes align more closely with an approach coping style (Self-expression, Emotion Processing), while others are more consistent with an avoidant (Distraction, Relaxation/Stress Relief). Previous studies also support the idea that dance can provide opportunities for both approach (releasing negative emotions; Leseho & Maxwell, 2010) and avoidance (temporarily forgetting stressors; Knestaut, Devine, & Verlezza, 2010) coping. Other coping strategies reflect internal changes that occur within dancers (Self-esteem, Perseverance), while still more reflect changes in the external environment (Safety, Social Support).

The final question that was asked of HA dancers assessed the physical effects, either positive or negative, of dance participation. Three themes were identified from the responses provided to this question: Positive Effects, Positive and Negative, and Negative effects. The most frequently endorsed theme by far was Positive Effects. Nine subthemes were identified within this theme, such as Fitness, Health, Flexibility, and Endorphins. A previous study of healthy amateur dancers, conducted by Quiroga, Kreutz, Clift, and Bongard (2010), also found general fitness to be the most commonly-reported physical benefit of dance, followed by posture, coordination, flexibility, balance, and decreased pain and physical impairments. Additional subthemes (Soreness and Exhaustion) were described by participants as both positive and negative. While some HA dancers described these as negative side-effects of dance participation, others described them as positive signs that improvement is occurring. Negative physical effects, such as Injury and Wear and Tear, were reported with the least frequency. Overall, HA dancers tended to view the physical effects of dance participation in a decidedly positive light. Even effects that might be viewed by others as negative were often seen as positive by these participants. This could be related to a difference between short-term and long-term effects. While soreness and exhaustion may feel negative in the short-term, many participants indicated that they view these effects as signals of increased gains in the long-term.

Limitations of the Study

Several limitations exist in the present study. First, the questionnaires administered to the two sample groups differed more than was initially intended, which

made comparing the two groups difficult. The data gathered from PD dancers was part of an ongoing evaluation of the effectiveness of the Dance for PD® program, and the questions under investigation in that project differed from the aims of this project. This resulted in changes being made to the questionnaire to better fit the program evaluation project, but which resulted in less appropriate fit with the goals of this study. Many of these changes were made prior to the distribution of the surveys, but after IRB approval had been obtained, which limited the ability to make corresponding alterations to the survey administered to HA dancers.

Additionally, communication between research teams in different geographical regions was difficult. This resulted in one team making decisions, such as altering items on standardized measures, that were not communicated to members of the other team. Because of this, HA dancers were asked to respond to scales and open-ended questions that were not asked of PD dancers. Also, some scales that were administered to both groups differed in item composition and response style. Accommodations were made for this by ensuring that only items answered by both groups were included in statistical analyses comparing the two groups. These differences limited the number of direct comparisons that could be made. Steps were taken to ensure that only appropriate comparisons were made, such as correcting for differences in response style and item composition of questionnaires, and that comparisons to normative samples were only made for standardized measures. However, the possibility remains that these inconsistencies adversely impacted the validity and reliability of the results presented above.

Another limitation of the study is that two different questionnaires were sent to the DfPD sample. One was sent by e-mail and a second, slightly different, questionnaire was given out at some dance classes. The HA questionnaire was administered exclusively in an on-line format using Qualtrics, which notifies participants when items are left unanswered. The PD questionnaire, alternatively, was administered through e-mail and via a pencil-and paper-format. This eliminates notifications of missed items and allows for the possibility of skipped pages. If there were any significant differences between participants completing on-line surveys and participants completing pencil-and-paper surveys, then this discrepancy could negatively influence the validity of the results.

Additionally, neither sample group was randomly selected, which may limit the generalizability of the results. The PD dancers were individuals who chose to participate in the Dance for PD® program, and then chose to assist with program evaluation efforts. The self-selected nature of the participants may have impacted their responses. For example, participants with less positive experiences may have left the Dance for PD® program prior to the study, or may have elected not to participate in the research. Additionally, HA dancers were recruited through e-mail notification and "snowball sampling" on social media. There may be a bias related to which of the individuals who received notification of the study chose to participate. For example, it is possible that only individuals with strong feelings about dance participation, either positive or negative, chose to take the time to complete the survey. This could have resulted in an excluded middle.

Finally, all of the data gathered during the course of the study were based on participant self-report. No corroborating data were gathered from other reporters, such as significant others, caregivers, or physicians. Self-report data may be influenced by the biased reporting of participants or by errors in recall, which can impact results. For instance, the influence of social desirability factors could have led participants in both groups to respond more favorably than they might have otherwise. It is important to interpret the results with the understanding that they are based on the subjective report of those who engage in dance, and may differ if data from other sources were included. For example, differences were found between the benefits PD dancers reported they have noticed within themselves and those commented upon by others. The inclusion of data obtained directly from these third parties could further highlight differences between changes observed by the self and changes observed by others. Using this method could also help to eliminate the influence of relationship factors on the results reported in this domain. While the purpose of this study was to gather information based on dancers' own experiences, the inclusion of other reporters in the future could provide a fuller picture of the benefits of dance participation.

Clinical Implications

The results of this study have several implications for clinicians interested in employing dance and movement therapy. First, HA dancers identified numerous ways in which they utilize dance as a coping tool. As discussed above, some of these methods are more consistent with approach coping, while others are more consistent with avoidant coping (Roth & Cohen, 1986). Clinicians wishing to maximize approach coping may be

able to encourage the use of dance to express or to process emotion. By facilitating this process, it may be possible to decrease the incidence of dancers using dance as a way to temporarily escape or forget about stressors.

Additionally, the HA dancers identified far more negative aspects of dance than did the PD dancers. Many of these negatives were related to competition with other dancers, pressure to perform well and to conform to a particular body image, and the receipt of negative feedback from instructors. PD dancers, on the other hand, identified primarily positive reactions to dance instructors, and were much more likely to report that there was nothing about their dance classes that they would like to change. This result is consistent with findings from the *International Positive and Negative Affect Schedule - Short Form* (I-PANAS-SF; Thompson, 2007), which indicated that HA and PD dancers reported similar levels of positive affect while dancing, but that HA dancers reported more negative affect. Those hoping to use dance in a therapeutic manner may need to take steps to ensure that the environment is supportive enough to encourage the expression of difficult emotions by taking care to address the negative factors raised by HA dancers in this study. This could potentially include avoiding the critique of movement, refraining from commentary on participant body type, and discouraging competition between participants.

Also, clinicians utilizing dance and movement must be aware of the potential for physical injury inherent in this activity. As the purpose of dance in a therapeutic context would not be skill improvement or performance preparation, it will be important to refrain from pushing participants to perform beyond their capabilities. This appears

feasible, as only HA participants reported sustaining injuries related to their participation in dance, and not PD participants.

Finally, the findings of this study have implications, not only for clinicians interested in facilitating dance and movement therapy, but for clinicians in other fields as well. Recent meta-analyses have found behavioral activation to be effective in treating depression (Mazzucchelli, Kane, & Rees, 2009) and improving overall well-being (Mazzucchelli, Kane, & Rees, 2010). Additionally, exercise has been found to be beneficial in the management of a variety of physical health concerns, including diabetes, heart disease, high blood pressure, obesity, and some cancers (U.S. Department of Health and Human Services, 1996). Despite the many potential benefits of physical activity, fewer than 10% of adults in the United States meet recommended activity levels (Tucker, Welk, & Beyler, 2011). This study found that both HA and PD dancers described dance classes as fun and expressed the desire to attend more classes than are currently available to them. This suggests that dance may be a promising referral for clients who would benefit from behavioral activation or exercise but who are struggling with adherence to other forms of physical activity.

Implications for Future Research

Although much was learned about the two samples in this study, some of the challenges of doing research at different sites also presented valuable learning opportunities. For example, ensuring that the respective needs of all groups are met while also including consistent measures and questions is important. In this study, the PD dancers were not directly asked about the physical effects of dance or the use of dance as

a coping skill. Asking multiple open-ended questions of the PD group was not a feasible part of this study, as the questionnaire was sometimes administered in a pencil and paper format, and writing is often difficult for individuals with PD. However, future studies could place a greater emphasis on gathering in-person qualitative data and use interviews to obtain responses to such questions. This would allow researchers to gain qualitative information from HA and PD dancers without overly taxing PD participants.

Future research could also benefit from the inclusion of alternate reporters instead of relying exclusively on self-report. For example, the inclusion of physicians may provide important information related to disease progression among the PD sample that the participants themselves are unaware of. Additionally, the questionnaire administered to the PD dancers asked participants to report whether or not others close to them had noticed any changes. Future studies could ask others directly about any changes they have seen rather than using participants as intermediaries.

Another potential area that future research could begin to address the impact of flow, or optimal experience, on the perceived effects of dance participation. Flow has been defined as "the state in which people are so involved in an activity that nothing else seems to matter" (Csikszentmihalyi, 1990, p. 4). Csikszentmihalyi emphasized the fact that both physical and mental involvement are required to achieve flow, and has described dance as "probably the oldest and most significant" method for generating flow (1990, p. 99). These descriptions are consistent with responses from participants in the present study, who highlighted the fact that dance is both physical and mental, and described the experience of becoming so engulfed in dance that they forgot about outside

concerns. It is possible that the experience of flow plays a role in the effects of dance participation on dancers. Future research could explore whether dancers report experiencing flow, and whether or not the experience of flow differs between amateur and clinical samples.

Finally, some DfPD participants have begun to participate in staged performances. Future research could explore whether, and in what ways, adding a performance component influences the way PD dancers respond to the measures included in this study. It is possible that performing for audiences could result in responses from PD dancers that more closely resemble those of HA dancers. For example, performance anxiety could result in increased levels of negative affect, and increased rehearsal of movement sequences could allow PD dancers to explore more artistic and spiritual aspects of dance.

Conclusions

The objective of the present study was to compare the effects of dance participation as perceived by two distinct groups of dancers: participants in the Dance for PD® and healthy amateur dancers. The study found that there was no difference between the two groups on positive affect experienced while dancing, but that HA dancers experienced higher levels of negative affect than PD dancers. HA dancers exhibited higher levels of self-efficacy, but there was no difference between the groups on perceived quality of life. Additionally, both groups identified the same two components of dance classes as the most helpful. Qualitative analysis of responses to open-ended questions found that, in general, HA and PD dancers identified similar factors as making

dance unique from other forms of exercise. The primary differences were that HA dancers more strongly emphasized artistic and spiritual components of dance, whereas PD dancers focused on the importance of the dance instructors and tailoring movements to individuals with PD. More differences were found between the two groups with respect to the negative aspects of dance classes. Notably, PD dancers identified almost none, while HA dancers described internal and external pressure, criticism, and competition as problematic. Clinicians looking to utilize dance and movement therapy could potentially use this information to ensure that dance therapy groups provide a safe environment for the exploration of difficult emotions. Additionally, dance may provide a useful referral resource for clinicians looking to improve adherence to behavioral activation and exercise-based interventions for a variety of presenting concerns. Future research could benefit from the use of more standardized research methodology, the inclusion of additional reporters, and the inclusion of PD dancers who participate in staged performances.

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Appendix A

Introduction to Survey - PD Dancers

You are the experts in this class! You have experienced and know in your own ways how Dance for PD (DFPD) affects you. We would like your input and ideas about how you think DFPD helps you and what keeps you coming back. Why do you think it “works?” The survey is intended to be anonymous. Your participation is entirely voluntary and should take no more than 10 minutes. We value your input!

Appendix B

Demographic Questions - PD Dancers

In what year were you diagnosed with PD?

What is your current age?

How many years of education have you completed?

Gender

Female

Male

Please describe your living situation.

I live alone.

I live with a partner or spouse.

I live alone but have a part-time professional carepartner.

I live with family (not partner or spouse).

I have a live-in professional carepartner.

Other

How long have you been coming to DfPD? **(Please check one response.)**

Less than 6 months

6 months to 1 year

1 to 2 years

More than 2 years

Appendix C

Demographic Questions - Healthy Amateurs

How long have you been dancing
____ Years

How frequently do you attend dance classes/rehearsals? **(Check one response.)**
____ Daily (on average)
____ Several times a week (on average)
____ Every week (on average)
____ Every two weeks (on average)
____ Once a month (on average)

Age: ____

Gender: ____Female ____ Male ____ Transgender

How many years of education have you completed?

High School 9 10 11 12 College 1 2 3 4 5 6 7+

What is your racial/ethnic background?

____ Native American
____ African American/Black
____ Caucasian/White
____ Hispanic
____ Asian
____ Pacific Islander
____ Biracial/Multiracial
____ Other:_____

In what kind(s) of dance activity do you participate? **(Check all that apply)**

____ Dance major/minor
____ Dance company
____ Competition team
____ Spirit/pom squad
____ Drill team
____ Choreographer
____ Instructor
____ Other (please specify):_____

Appendix D

International Positive and Negative Affect Schedule - Short Form

Think about how you normally feel while dancing. For each of the items below, indicate the extent to which you experience that feeling while dancing by marking a number on the scale from 1 (Never) to 5 (Always).

1 2 3 4 5
Never Always

- Upset
- Hostile
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Afraid
- Active

Appendix E

Rosenberg Self-Esteem Scale

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

| 0 | 1 | 2 | 3 |
|-------------------|----------|-------|----------------|
| Strongly Disagree | Disagree | Agree | Strongly Agree |

- ___ On the whole, I am satisfied with myself.
- ___ At times, I think I am no good at all.
- ___ I feel that I have a number of good qualities.
- ___ I am able to do things as well as most other people.
- ___ I feel I do not have much to be proud of.
- ___ I certainly feel useless at times.
- ___ I feel that I'm a person of worth, at least on an equal plane with others.
- ___ I wish I could have more respect for myself.
- ___ All in all, I am inclined to feel that I am a failure.
- ___ I take a positive attitude toward myself.

Appendix G

Perceived Support from Dance Questionnaire

Please rate the following statements based on how strongly you agree or disagree. If you're not sure, please mark "3" in the middle column.

| 1 | 2 | 3 | 4 | 5 |
|----------------------|----------|---------|-------|-------------------|
| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |

- _____ I feel supported by my dance teacher(s).
- _____ When I have a problem, I feel I cannot talk to my dance teacher(s) about it.
- _____ I have made friends in my dance classes.
- _____ I rarely get together with people I have met in dance class outside of class.
- _____ When I have a problem, I can talk to other dancers about it.
- _____ The dance studio is a supportive environment.
- _____ I feel less lonely because of my participation in dance class.
- _____ I feel isolated from others in my dance class.
- _____ There is not much sense of community in my dance class.
- _____ I believe other dancers would help me if I needed assistance

Appendix H

Activities of Daily Living Questionnaire

Please rate the following statements based on how you think Dance for PD classes have affected activities that occur outside of the studio. If you're not sure, please mark "1" in the first column.

| 1 | 2 | 3 | 4 | 5 |
|----------|----------------------|----------|-------|-------------------|
| Not Sure | Strongly Disagree | Disagree | Agree | Strongly Agree |

- ___ I perform at least one activity of daily living with more ease.
- ___ I perform several activities of daily living with more ease.
- ___ I have more confidence going about my daily activities.
- ___ I find it easier to get around the house.
- ___ I trust my balance more when I'm out and about.
- ___ I'm able to think about my movement more logically.
- ___ I integrate music and rhythm more fully into my daily life to help me get things done.
- ___ I find myself thinking during the day about things my teachers say about posture.
- ___ I find myself thinking during the day about things my teachers say about different qualities of movement (soft, sharp, floating).
- ___ I find myself thinking during the day about images my teachers use in class to describe dance steps or movements.
- ___ I'm able to move more fluidly.
- ___ I don't see much effect on daily activities.
- ___ Other (please specify): _____

Appendix I

Benefits of Dance - PD Dancers

What parts of the class do you think are most valuable to you? **(Please check all that apply.)**

- Doing something creative
- Social interactions with other class members
- Participating in a group activity with others
- Doing something fun
- Being out of the house for a while and having someplace to go and something meaningful to do
- Connections with the teacher(s); knowing someone is interested and cares
- Feeling physically “free” for a while
- Moving and getting some exercise
- Music (live)
- Music (recorded)
- Other (please specify) _____

Appendix J

Benefits of Dance - HA Dancers

If yes, using the scale below and on the line before each item, please indicate the number you think best describes how much you think dance helps each of the following?

| | | | |
|------------|---|---|--------------|
| 1 | 2 | 3 | 4 |
| Not at all | | | A great deal |

- Doing something creative
- Social interactions with other class members
- Participating in a group activity with others
- Doing something fun
- Being out of the house for a while and having someplace to go and something meaningful to do
- Connections with the teacher(s); knowing someone is interested and cares
- Feeling physically “free” for a while
- Moving and getting some exercise
- Music
- Other (please specify) _____

Appendix K

Challenges of Dance

What, if anything, do you find particularly challenging about Dance for PD? **(Please check all that apply.)**

- The dance steps themselves
- Doing a series of different movements in a set amount of time
- Following sequences of movements
- Remembering the sequences of movements
- Staying on the beat
- Being spontaneous during improvised exercises
- Doing the exercises at the same speed as the instructor
- Moving across the floor
- Keeping my balance
- Other (please specify) _____

Appendix L

Symptom Changes: Self-Report

Do you think DFPD helps you to feel better?

- Yes
 No

If yes, using the scale below and on the line before each item, please indicate the number you think best describes how much you think DFPD helps each of the following?

- | | 1 | 2 | 3 | 4 |
|---|------------|---|---|--------------|
| | Not at all | | | A great deal |
| <input type="checkbox"/> Improves motor symptoms | | | | |
| <input type="checkbox"/> Improves mood | | | | |
| <input type="checkbox"/> Increases a sense of well-being | | | | |
| <input type="checkbox"/> Increases a sense of accomplishment | | | | |
| <input type="checkbox"/> Helps me feel like my pre-Parkinson's self for a while | | | | |
| <input type="checkbox"/> Gives me a sense of freedom | | | | |
| <input type="checkbox"/> Helps me focus on something besides PD for a while | | | | |
| <input type="checkbox"/> Helps me feel less isolated for a while | | | | |
| <input type="checkbox"/> Other (please describe) _____ | | | | |

If you believe that the DFPD class helps you, how long do you think that improvement lasts? (**Please check only one response.**)

- Until the class is over
 For a few hours
 A few days
 Until the next class
 A month
 Don't know

Appendix M

Symptom Changes: Other-Report

What changes have others (e.g., family members, physicians, physical therapists) observed since you began participating in Dance for PD classes? **(Please check all that apply.)**

- They say I project more confidence.
- They say I perform activities of daily living more easily.
- They say I am more positive in my outlook.
- They say I am better coordinated.
- They say I have a renewed interest in creativity and the arts.
- They say I have renewed interest in physical wellbeing.
- They say that I walk more easily.
- They say I appear to have better balance.
- They say they haven't seen any changes.
- I have not heard any comments about changes.

Appendix N

Open-Ended Question - PD Dancers

Do you think DFPD is different from other exercise classes you may have taken?

- Yes
- No
- Not sure

What do you think makes DFPD different?

What, if anything, do you not enjoy about DFPD? What would you like to change about the class?

Appendix O

Open-Ended Questions - HA Dancers

What other classes or groups do you attend?

What do you think makes dance different?

What, if anything, do you dislike about dance classes?

Does dance help you to cope?

Yes

No

Tell me more about it.

Do you experience physical effects, either positive or negative, from your participation in dance?

Yes

No

Tell me more about them.