

# **Fitness Benefits of Line Dancing**

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## **Introduction**

In my incessant research about dances on the world wide web in the summer of 1997, I stumbled across line dancing. It was, among all the other dances I've seen on virtual space, something new to me. Most importantly, I gauged it as something I could learn on my own with minimal cost on my part. I eventually was able to institute a PE 2 Line Dancing subject at the College of Human Kinetics and was one of the Physical Education courses offered starting the second semester of academic year 1996-97.

## **What is Line Dancing?**

For simplicity, I introduce line dancing to my students as “dancing in line”. More clearly defined, it is a choreographed dance that is performed repeatedly for the duration of the music by groups of people in lines. Emphasis is placed on the elements of line dance as having a (1)choreographed sequence of steps that is (2)performed repeatedly to differentiate it from other forms of dancing.

## **Development of the Course**

There were a lot of resources on the web when it came to the availability of line dance sheets, or step descriptions of a variety of line dances. From a handful that I downloaded, I had to pick just enough to cover a whole semester's worth of class learning for PE students. The choices were, of course, narrowed down by the availability of the music – majority of which were American country-western. At that time, I had to contend with

searching for music at various music stores. [*Peer to Peer file sharing or P2P wasn't existent yet. Napster started P2P by mid 1999*]. During my music searches, I always had with me my master list of music for my downloaded line dances.

Having obtained all the music tapes I could find, I proceeded to separate the line dance sheets for which I had the music for from the rest of the pile. These dance sheets then had to be grouped into various levels of difficulty, based initially on what was indicated on the dance sheet [*beginner, advanced beginner, intermediate, advanced intermediate, advanced*].

Instead of going with the 5 classifications of levels, I simplified it to 3 levels: beginner, intermediate & advanced. I had to eventually go through each dance sheet, analyzing the level of difficulty of the steps used, and arrange the sequence of teaching the dances within each level in such a way that the process of learning and skill progression is smooth and effective. In addition, the sequence of dances should allow for low-keyed dances to serve as either warm-up or cool-down while the higher intensity dances were placed in the middle of the sequence to provide for intensity progression.

Alongside the objectives of students' learning and appreciation of the line dances & the development of students' musical & rhythmic sense, a fitness component was also included. It was stated that the fitness level of students were to improve. And for this, I had to include fitness testing sessions that would provide me with proof that this objective was being achieved.

### What fitness parameters were to be tested and how?

As line dancing involves a lot of footwork and legwork, it was easily assumed that the fitness component likely to be developed was cardiovascular or cardio-respiratory fitness. To evaluate any improvement in participants' cardiovascular fitness, the **step test** was used for the following reasons: it required minimal cost, if any, to administer; it required equipment that were readily available at the college [benches; audio player – in place of a metronome]; it required minimal time to administer [3

minutes per test administration]; & more than one participant could be tested at a time. Although the step test is not considered the best method for measuring cardiovascular fitness, it has been an accepted test alternative to other more equipment-intensive and time-consuming cardiovascular fitness tests. At present, there are many existing versions of the step test. Despite the variations in test procedures and implementation, basically, *“the step test works on the principle that individuals with a high level of cardiorespiratory fitness will have a lower heart rate during recovery from 3 minutes of standardized exercise (bench stepping) than less conditioned individuals.”* [Powers, 2003]

In addition to the step test, the monitoring of the students' **resting heart rate** was another source of information that could shed light on any improvement in their fitness level, if any. *“Unless you have a pathological condition, a lower resting heart rate indicates a stronger heart. To adapt to cardiorespiratory or aerobic exercise, blood volume increases, the heart enlarges, and the muscle gets stronger. A stronger heart can pump more blood with fewer strokes.”* [Hoeger & Hoeger, 2007]

### Administration of the FITNESS TEST

A whole class session was allotted for the fitness test due to the number of students to be tested in 45 to 50 minutes, the allotted duration of the class session. The fitness test dates scheduled during the semester were: (1) right after class orientation, before regular line dance sessions start for level 1; (2) right after level 1 exams, before starting level 2 line dance sessions; (3) right after the level 2 exams, before starting level 3 line dance sessions; and (3) at the end of the semester, right after the level 3 exams have been given. During the second semester, however, a slight modification was made in the fitness test date schedule, taking into consideration the more than 2-week Christmas break of the students. This was done to monitor any changes in the fitness level achieved due to non-participation in the activity for the duration of the break.

The students were oriented on the fitness tests to be

administered during class orientation. They were taught how to take their pulse rates and how bench stepping is done. As a precaution to making sure that the test was standardized, students try taking their pulse rates and practice stepping on the bench during this session.

Upon coming to class for the test, all students were asked to sit down on the gym floor and keep quiet for at least 5 minutes. In consideration of the fact that the students came from their classes from other venues, this 5-minute quiet time aimed to bring down the students' heart rates to a resting pace. After this quiet time, students were asked to take their pulse rates for one minute on cue. After doing so, they record their scores on their cards.

About ten students are then assigned to each available gymnasium bench which is 12" in height, while the rest of the students wait for their turn. They are instructed to place their pens and cards underneath the bench for easy retrieval after bench-stepping and reminded that they should straighten their legs when atop the bench. When ready, a tape recording of the beat the students are to follow while going up-up-down-down the bench is played. They are given the cue on when to start (the recording has an 8-beat intro, after which the beat continues playing for the next 3 minutes at 88 bpm), when to change starting leg (to prevent fatigue of one leg), and when to stop and sit down on the bench.

Right after the 3-minute step test, the students sit down on the bench for 1 minute to rest to try to lower their heart rates. They are reminded that they are to count their pulse rates 3 times during their rest, and that they have to record each one on their card. After their 1-minute rest, they are given the cue to count their post exercise heart rates on: 1-1.5 minutes / 2-2.5 minutes / 3-3.5 minutes. The 3 post exercise heart rate results are then added to come up with their recovery index.

### The Line Dance syllabus

As mentioned earlier, only 3 difficulty levels were used: Level 1 (beginner level), Level 2 (intermediate level), and Level 3

(advanced level). Take note of the speed of the dance in beats per minute; the length of the dance (this is exclusive of the music introduction); and the sequence length in number of counts in the sequence of the choice of dances that follow:

#### Level One

Dance Code	Music Type Bpm/dance duration	Dance Description	New Competencies & Skills learned
01-HH	<i>Country</i> 124 bpm @ 3:07	24-ct, 4-wall line dance stationary	Orientation to the 4 walls, concept of repetition despite non-conformity to musical cues
02-RC1	<i>Country</i> 114 bpm @ 2:55	32-ct, 4-wall line dance	side-close steps, heel digs, stomps, quarter military (pivot) turns creativity/styling in shakes
03-RC2	<i>Country</i> 110 bpm @ 2:55	24-ct, 2-wall line dance	shuffle, jazz box, half military (pivot) turns
04-SS	<i>Country</i> 135 bpm @ 2:14	32-ct, 2-wall line dance	Toe fan, vine
05-S	<i>Country</i> 128 bpm @ 3:00	24-ct, 2-wall line dance	Heel and Toe taps Vine variation (with brush and turns) $\frac{3}{4}$ turn
06-TCCC	<i>Country</i> 135 bpm @ 2:50	32-ct, 4-wall line dance	basic cha cha, cross over cha cha, slur
07-W	<i>Non-Country</i> 146 bpm @ 2:26	32-ct, 4-wall line dance	Charleston, vine variation (turning vine), walks, step touches
08-CnD	<i>Country</i> 107 bpm @ 3:50	32-ct, 2-wall line dance	Cross-ball-step, pendulum swing Repetition starts on opposite foot

#### Level Two

Dance Code	Music Type Bpm/dance duration	Dance Description	Competencies & Skills
9-DQ	<i>Non-Country</i> 102 bpm @ 3:20	44-ct, 4-wall line dance	Disco points & touches Disco Styling $\frac{1}{4}$ CW to $\frac{1}{2}$ CCW turn
10-ABH	<i>Country</i> 123 bpm @ 3:08	32-ct, 4-wall line dance	Hip bumps, pivots, hitch, $\frac{3}{4}$ turn
11-QS	<i>Non-Country</i> 156 bpm @ 1:35	40-ct, 2-wall line dance	Kick ball change, step back with heel touches, shoulder pushes, slide step, vine variation (double vine)
12-BBT	<i>Non-Country</i> 134bpm @ 1:24	64-ct, 4-wall line dance	Monterey turn, rock step, Charlie chaplin step, swivels
13-UDT	<i>Non-Country</i> 126 bpm @ 4:17	32-ct, 4-wall line dance	Side rock steps, crossing triple, star points, turning triple step, coaster step
14-TW	<i>Country</i> 168 bpm @ 3:12	64-ct, 4-wall line dance	Foot boogie, syncopated star points, jazz jump, twists, jazz box variation (with quarter turn), vine variation (with quarter turn) Step combinations

### Level Three

Dance Code	Music Type Bpm/dance duration	Dance Description	Competencies & Skills
15-B	<i>Non-Country</i> 100 bpm @3:17	48-ct, 2-wall line dance	Sailor shuffles, side shuffles (side cha cha) ½ turn to ¾ turn Cuban styling
16-TS	<i>Country</i> 116 bpm @ 3:12	64-ct, 2-wall line dance	Sailor variation (sailor turn), out-out in-cross, unwind
17-CB	<i>Country</i> 149 bpm @ 3:04	144-ct, 3-wall line dance	Rock variation (rocking chair), twist & cross step, vine variation (syncopated vine), swivets, travelling turns, hip grinds, chacha variation (turning chacha), shimmies, heel grind, Monterey variation (modified Monterey), out-out/in-in

In summary, the ranges of intensities of the dance choices are as follows:

	Dance Speed	Sequence length	Dance length
Level 1	107 bpm - 146 bpm	24 cts – 32 cts	2:14 – 3:50
Level 2	102 bpm – 168 bpm	32 cts – 64 cts	1:24 – 4:17
Level 3	100 bpm – 149 bpm	48 cts – 144 cts	3:04 – 3:17

A typical semester at the university lasts 16 weeks. The treatment period, inclusive of the testing dates will cover only a period of 12 weeks. The remaining 4 weeks were allotted for the orientation sessions, written exam, and group work for final exam. During the 12 weeks, students were taught the different line dances, with a new line dance taught each session. The line dance classes meet twice a week for 45 to 50 minutes each session. As part of the class warm-up, students perform the previously taught line dances. This also serves as their review in preparation for the upcoming level exam. It is during this warm-up/review that students dance continuously.

In summary, students learn 8 dances in level one, 6 dances in level 2, and 3 dances in level 3. If danced one after the other, the class is given the opportunity to dance continuously for 23:17 minutes (level 1 dances); 16:56 minutes (level 2 dances), and 9:33 minutes (level 3 dances). On the meeting before a scheduled exam, the class is given one whole session for review. It usually happens that they go through the set of dances for 2 to 3 runs during that review session. It is this situation that is very promising for improved fitness levels.

### Raw Observations:

Raw data, without any statistical treatment were observed right

after every fitness test. The following tables were constructed using resting heart rate ratings [Hoeger & Hoeger, 2007] to illustrate what was observed at that time. Although two to three sections of line dance classes were opened every semester, the data below only reflected data of students who were able to complete all fitness test dates. Students with incomplete data (due to absence during the fitness test date) were removed from the following sample data set from academic year 1998-1999 [This was the available complete data set for a whole academic year].

### **FIRST SEMESTER 1998-99** (32students)

	June 98	July 98	July 31-98	Sept 99
Excellent (< 59)	2 6.25%	2 6.25%	1 3.12%	2 6.25%
Good (60-69)	9 28.12%	5 15.62%	5 15.62%	3 9.37%
Average (70-79)	8 25%	11 34.37%	13 40.06%	13 40.06%
Fair (80-89)	7 21.87%	9 28.12%	9 28.12%	12 37.5%
Poor (> 90)	6 18.75%	5 15.62%	4 12.5%	2 6.25%

### **SECOND SEMESTER 1998-99** (128 students)

	Nov 98	Dec 98	Jan 99	Feb 99
Excellent (< 59)	6 4.68%	7 5.46%	12 9.37%	10 7.81%
Good (60-69)	11 8.59%	24 18.75%	16 12.5%	12 9.37%
Average (70-79)	35 27.34%	42 32.81%	34 26.56%	38 29.68%
Fair (80-89)	39 30.46%	39 30.46%	35 27.34%	46 35.93%
Poor (> 90)	37 28.90%	16 12.5%	31 24.21%	22 17.18%

It is clearly observed from the first semester data that students classified as having ‘poor’ fitness were decreasing in number as time went by. Although the number of those having ‘excellent’ fitness remained relatively the same, those in the ‘good’ fitness category lessened, while majority of students clumped towards a ‘fair’ to ‘average’ fitness level.

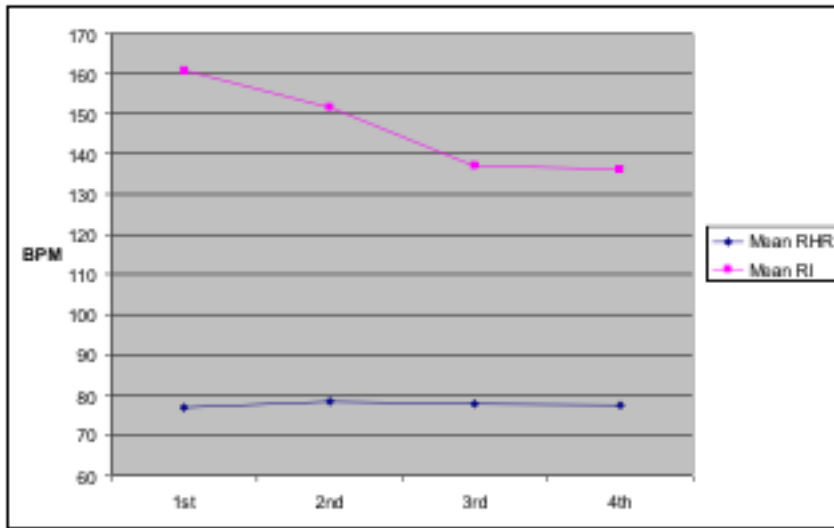
The second semester data, on the other hand, shows an increase of students in the ‘average’, ‘good’ and ‘excellent’ fitness levels. These were not maintained as seen after the Christmas break where the number of students in the ‘fair’, ‘average’, and ‘good’

fitness levels lessened. Though, after the resumption of classes, majority of students clumped towards a 'fair' to 'average' fitness level by the last fitness test date.

### Overall Results:

Data obtained from the first and second semesters of academic year 1998-1999 were treated statistically [statistical treatment by Peter Fermin *Dajime*] and garnered the following results:

### **Mean Values of Resting Heart Rates and Recovery Indices of Line Dance Students (n = 24) at Different Periods during the First Semester SY 1998-1999**



The mean resting heart rates are 76.8, 78.2, 77.9 and 77.4 beats per minute for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> test period respectively.

An analysis of variance repeated measures model was used to determine if there is at least one mean value that is significantly higher or lower than the other three. The Wilks' Lambda was used as the test statistic and the computed value was 0.963. The accompanying Fisher's value was 0.262 which has a p-value of 0.852. The statistics show that there is no evidence to suggest that at least one mean resting heart rate is significantly different.

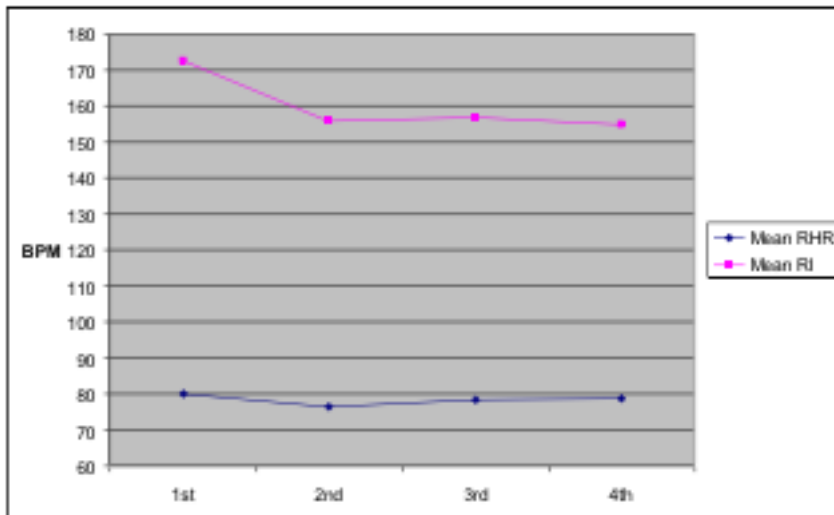
On the other hand, the graph of the 4 mean recovery indices show a decreasing trend over time. The graph suggests that



recovery after exercise is faster following several months of training. The mean recovery indices are 160.7, 151.7, 136.9, and 136.3 for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> test period respectively. The Wilks' Lambda is 0.234 with an F-value of 22.847 and a p-value of 0.0000008. The null hypothesis of no significant difference has to be rejected because of a small p-value and a pairwise comparison (LSD) followed.

The multiple comparison tests showed that the mean recovery index of the first test period is significantly higher than the succeeding recovery indices (i.e. p-value = 0.007, p-value = 0.000, p-value = 0.000). It also showed that the mean recovery index of the second test period is significantly higher than the succeeding recovery indices (i.e. p-value = 0.000, p-value = 0.000). However, there is no significant difference in the mean recovery index between the third and fourth test periods (i.e. p-value = 0.826)

### **Mean Values of Resting Heart Rates and Recovery Indices of Line Dance Students (n=78) at Different Periods of the Second Semester of SY 1998-1999**



The mean resting heart rates of students were 79.9, 76.3, 78.5, and 78.6 for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> test periods respectively. The same statistical analysis was employed and revealed that there is at least one mean resting heart rate that is significantly different (i.e. Wilks' Lambda = 0.816; F-value = 5.633; p-value = 0.001).

The multiple comparisons tests (i.e. LSD) showed that the mean resting heart rate of the first test period is significantly higher than the second test period but not with the third and fourth test period (i.e. p-value = 0.000, p-value = 0.271, p-value = 0.245).

The mean resting heart rate of the second test period is significantly lower than the third test period but not with the fourth (i.e. p-value = 0.046, p-value = 0.056). And the mean resting heart rate for the third period is not significantly different with the fourth period (i.e. p-value = 0.939). This is probable because the third test period was conducted after the Christmas break.

However, the value of the 4<sup>th</sup> test period should have gone down since the students had a month of training after the third test period. The resting heart rate in the 4<sup>th</sup> test period didn't go down. This may be attributed to the fact that the speed of the dance selections weren't as fast as the previous dances. In consideration of the higher degree of difficulty of the steps in the chosen dances, the choice of slower dances resulted.

The mean recovery indices of the students were 172.4, 155.7, 156.8, 154.7 for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> test periods respectively.

SPSS 11.5 was used to derive the following test statistics Wilks' Lambda = 0.619; F-value = 15.372; and p-value of the said statistics is 0.00000007. It means that at least one mean recovery index is significantly different. A multiple comparisons test using the Least Significant Difference method was used as post hoc analysis. The mean recovery index for the first test period is significantly higher than the succeeding recovery indices (i.e. p-value = 0.000, p-value = 0.000, p-value = 0.000). The mean recovery index of the second test period is not significantly different to the scores in the third and fourth test periods (i.e. p-value = 0.579, p-value = 0.627). The scores from the third test period is not different from the fourth test period (i.e. p-value = 0.357).

### Subjective Evaluations Observed:

In addition to the fitness benefits observed above, other student

improvements observed were:

1. Developed Alertness to Verbal Cues - Usually, students in dance classes take in instructions via visual cues & instructions or the demonstration method. Since the dances were performed facing a different wall each time the sequence was repeated, it would have been inefficient for an instructor to run in front of the class for the next repetition. The teaching style devised for the line dance class relied on the giving of verbal cues. Therefore, barking out instructional cues in time with the music was given, and knowledge of the names of the steps was emphasized.
2. Developed Rhythmic Abilities and Musicality – Students, due to their constant exposure to the instructor’s barking out of instructional cues in time to the music were developing their own rhythmic abilities. And this was keenly observed in their improved performance in class, their exam results and as evidenced by their interpretations of their line dance sheets for the final group work. In addition, LSS or ‘Last Song Syndrome’ is acutely observed.
3. Enjoyment in synchronized dancing as verbalized and ‘blogged’ by students – There is a certain satisfaction in dancing or doing things together
4. Improved mental acuity & concentration– This is constantly developed by the increased use of memorization skills applied in memorizing the sequence of the dance steps. Any breakdown in memory will obviously be observed in the performance of the dance.
5. Application of proper body mechanics (posture, balance, coordination) – The continuous transfer of weight required in dancing can be effectively achieved only if one has the proper posture, balance and coordination. Dancing without these is an accident waiting to happen.

#### Advantages to Engaging in Line Dancing as a Fitness Activity:

There are several advantages to engaging in line dancing as a fitness activity:

1. Minimal costs to participate – At most, you may just have to purchase dance shoes.
2. No specialized equipment required – just your audio tape or CD and player
3. No minimum age requirement nor limitation on age. Even your grandmother can participate!
4. No special skills required. No dance background necessary. Even one with zero-knowledge base in dancing may effectively participate.
5. No risk of injury in participation. Safe, as long as your dance floors aren't slippery.

### Conclusion & Recommendations:

Conclusively, though with moderate results, this study proves that participation in line dancing classes improves cardiovascular health, specifically in the lowering of resting heart rates and improved recovery index of participants. This study was also able to show that participation in a fitness activity or assessment of fitness need not be expensive. There are affordable alternatives available.

Constant monitoring and assessment of fitness levels of participants may contribute to the improvement of a dance program that seriously considers fitness as one of dance participation's main objective. So, for this study, if a better fitness result for the 4<sup>th</sup> fitness test is to be prioritized, another set of level 3 dances have to be put in place that would have higher bpm. A scrutinizing review of the dance program's workout intensity, duration of performance alongside continuous fitness assessment will go a long way in contributing to a healthy and fit generation.

*“Line dancing . . . takes my breath away!”  
– comment of current line dance student*

### Post Script:

The first PE 3 or advanced line dance class was opened starting the first semester of academic year 2008-2009. Among the enrollees, is a former student who is currently taking up her

masters in chemistry, another one who claims that this is his 7<sup>th</sup> P.E [U.P. students are required to take up only 4 P.E. subjects in the course of their residency], & a physics major [known to be a gifted child].

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