Use of the Portable Stereo Cassette Player during Jogging

Use of the Portable Stereo Cassette Player during Jogging

Hiroh YAMAMOTO* and Kenji SHAMOTO**

ABSTRACT

The purpose of this study was to measure the effect of the use of Sony Walkman Stereo Cassette Player (SWSCP) upon distance and perceived exertion of joggers. Ten male students with prior experience in jogging volunteered to perform 5-minute jogging tests: 1) SWSCP-JOG ..... jogging to music by means of headphones and Sony Walkman Stereo Cassette Player and, 2) JOG .....jogging without music. Identical music was used for all subjects for the SWSCP-JOG test. Throughout each test measurements of rating perceived exertion, number of strides and distance were obtained. The subjects signalled the scale score at the final half minute with the use of Borg Scale. The distance of each subjects run during the 5-minute test was measured and the number of strides taken during that distance was counted. Calculation of each subject's stride length was obtained from the distance and stride frequency data. RPE during SWSCP-JOG tended to be lower than that of the JOG condition. Conversely, heart rate, distance, speed, stride frequency and stride length during SWSCP-JOG tended to be higher than during the JOG. In other words, in this study, the distance was higher during SWSCP-JOG than during JOG for subject. However, the RPE was lower during the SWSCP-JOG condition than during the JOG condition. This suggests that the use of SWSCP had a favorable psychological effect of the joggers. In addition, excess stress may have been reduced. It appears that joggers will run longer and more comfortable with such a device as the Sony Walkman Stereo Cassette Player is used during jogging than if it were not used.

Because of the millions of people who are participating in jogging type fitness programs, it is important to determine scientifically some means of maximizing the benefits of these jogging programs. In order to do this, millions of dollars have been spent on new technology that has produced better shoes, better jogging surfaces, and innovative jogging trails. In addition, special devices that joggers can hold in their hands or strap to their bodies have been manufactured to enhance the jogger's performances. One of these pieces of equipment is the Sony Walkman Stereo Cassette Player, weighing 2.2 newtons introduced in the 1970's.

* Department of Physical Education, Faculty of Education, Kanazawa University, Kanazawa, 920, Japan.

** General Affairs Department, Ohguchi Town Office, Aichi, 480−01, Japan.

Many joggers use this cassette player for purposes of relaxation, novelty and entertainment. However, no data exist that indicates exactly what benefits are obtained from the use of such a stereo cassette player during jogging. In other words, there has been no scientific plan to maximize the use of this device so that joggers will obtain the greatest benefits from its use.

We have conducted some preliminary research data to provide limited information concerning the use of the Sony Walkman Stereo Cassette Player during jogging. The purpose of that research was to determine the effect of the use of the Sony Walkman Stereo Cassette Player (hereafter termed SWSCP) upon heart, rate, distance and speed, and perceived exertion of joggers.

METHODS AND PROCEDURES : Ten healthy male students with prior experience in jogging volunteered to perform 5-minute jogging tests: 1) SWSCP-Jog ·····jogging to music by means of headphones and Sony Walkman Stereo Cassette Player; and, 2) JOG·····jogging without music. Identical music was used for all subjects for the SWSCP-JOG test. Test order was randamized and 15-min. rest intervals were set between tests to insure approximately 90% heart rate recovery. Throughout each test measurements of heart rate, ratjng of perceived exertion, number of strides and distance or run were obtained. The physical characteristics of the subjects are shown in Table 1.

The electrocardiogram was recorded with a radiotelemetry system. Electrodes placed on the body according to standard procedures and the transmitter were worn.

Although continuous recordings were obtained, the heart rate value was calculated every half minute. The ratings of the subjects' perceived exertion were recorded each half minute as well.[3] The subjects signalled the scale score representing his perceived exertion at final half minute. The scale (RPE) is given in Table 2.[1]

The distance of each subjects' run during the 5 minute test was measured and the number of strides taken buring that distance was counted. Calculations of each subject's speed and stride length were obtained from the distance and stride frequency data.

RESULTS AND DISCUSSIONS : Table 3 shows the means of heart rate, RPE, distance, speed, stride frequency and stride length for both conditions: SWSCP-JOG and JOG. Heart rate, distance, speed, stride frequency, and stride length during the SWSCP-JOG were higher than during the JOG. Conversely, the RPE during SWSCP-JOG was lower than that of the JOG condition.

These favorable effects experienced during the SWSCP-JOG condition were analyzed further with respect to the individual subjects. Table 4 and Table 5 present individual comparisons of distance, speed, stride frequency and stride length during the two jogging conditions. Nine of the ten subjects showed greater distance (thus greater speed) during the SWSCP-JOG condition than during th JOG condition. Subjects SS, HH, KH, and SO ran farther because of higher stride frequency or higher stride length during the SWSCP-JOG condition. The exception, subject TD, ran a shorter distance during the SWSCP-JOG condition than during the JOG condition because of both lower stride frequency and

lower stride length.

Subject TD was the second fastest runner. In general, the gains appeared to be experienced to a greater extent for the slower runners than for the faster runners. Since these gains were greatest with respect to stride length, not frequency, the cadence of the music could not be considered a major contributing factor.[2)]

As expected the heart rate for the subjects during SWSCP-JOG was higher than during JOG, since the work done, as well as the power, during the five minute test was greater. However, it is interesting to note that the RPE during the SWSCP-JOG condition was lower than during the JOG condition. This suggests that use of the SWSCP had a favorable psychological effect upon the joggers. In addition, excess stress may have been reduced. It appears that joggers will run longer and more comfortable if such a device as the Sony Walkman Stereo Cassette Player is used during jogging than if it were not used.

The preliminary research has provided data which suggest that the jogging benefits from the use of the Sony Walkman Stereo Cassette Player may be quantified.

It is evident moreover that research using differenct approaches including age, sex and race difference, is necessary. The present research indicated the type of instrumentation that could be used and indicated what benefits might be accrued via the use of the Sony Walkman Stereo Cassette Player.

ACKNOWLEDGEMENT

Helpful suggestions and observations and a critical reading of the manuscriptare gratefully acknowledged to Professor Marlene Adrian, Ph. D., during my stay as a visiting Professor from Kanazawa University to Washington State University, U. S.; a recipient of Rotary International Fund in the academic year 1982 to 1983.

Table 1. Physical characteristics of subjects.

Subject	Age (years)	Height (cm)	Weight (kg)
S.S.	19	176	62
S.O.	24	176	67
H.T.	20	166	54
I.S.	22	177	70
K.T.	19	167	63
H.N.	23	169	61
H.H.	22	165	62
T.D.	22	167	61
H.Tk.	19	171	73
K.H.	22	171	57
Mean	21.2	170.5	63.0
S. D.	1.7	4.2	5.4

Table 2. RPE scale, cited from the reference of Borg, G.A.V.: Perceived exertion; a note on "history" and methods. Med. Sci. Sports. 5 (2): 90−93, 1973.

RPE	SCALE
20	
19	Very, very hard
18	
17	Very hard
16	
15	Hard
14	
13	Somewhat hard
12	
11	Fairly light
10	
9	Very light
8	
7	Very, very light
6	

Table 3. Means of heart rate (beats/min.), rating perceived exertion (RPE), distance (m), speed (m/min.), stride frepuency (steps/min.) and stride length (m/step) during 5-minutes jogging (JOG) and 5-minutes jogging to music with headphone (SWSCP-JOG).

Items	JOG	SWSCP-JOG
Heart Rate (beats/min.)	159.3	168.5
R.P.E.	11.1	10.7
Distance (m)	1028.6	1087.0
Speed (m/min.)	205.7	217.4
Stride Frequency (steps/min.)	80.6	82.0
Stride Length (m/step)	2.6	2.7

Table 5. Stride frequency during 5-minutes jogging for each subject.

Joggiog

Subject		Stride frequency (steps/min)				
		0-1'	1'-2'	2'-3'	3'-4'	4'-5'
Novice jogger	S.S.	76	76	74	74	76
	H.T.	78	80	76	76	78
	K.T.	76	78	78	78	74
	H.H.	86	86	86	88	88
	H.Tk.	78	78	78	78	78
	Mean	78.8	79.6	78.4	78.8	78.8
	S. D.	3.7	3.4	4.1	4.8	4.8
Experienced jogger	S.O.	94	92	90	92	94
	I.S.	80	80	82	84	82
	M.N.	74	76	74	74	76
	T.D.	86	82	86	86	88
	K.H	76	76	78	80	78
	Mean	82.0	81.2	82.0	83.2	83.6
	S. D.	7.3	5.9	5.7	6.0	6.6
Total	Mean	80.4	80.4	80.2	81.0	81.2
	S. D.	6.0	4.9	5.3	5.9	6.3

Jogging to music with headphone

Subject		Stride frequency (steps/min)				
		0-1'	1'-2'	2'-3'	3'-4'	4'-5'
Novice jogger	S.S.	72	74	74	74	76
	H.T.	80	78	80	80	80
	K.T.	82	82	84	84	86
	H.H.	82	86	86	88	88
	H.Tk.	80	78	78	78	78
	Mean	79.2	79.6	80.4	80.8	81.6
	S. D.	3.7	4.1	4.3	4.8	4.6
Experienced jogger	S.O.	94	90	92	92	92
	I.S.	86	88	84	84	84
	M.N.	76	80	78	78	78
	T.D.	86	84	82	80	80
	K.H.	80	80	82	82	82
	Mean	84.4	84.4	83.6	83.2	83.2
	S. D.	6.1	4.1	4.6	4.8	4.8
Total	Mean	81.8	82.0	82.0	82.0	82.4
	S. D.	5.7	4.7	4.7	5.0	4.8

Table 4. Distance during 5-minutes jogging for each subject.

Jogging

Subject		Distance (m)
Novice jogger	S.S.	823
	H.T.	1090
	K.T.	867
	H.H.	1023
	H.Tk.	852
	Mean	931.0
	S. D.	105.6
Experienced jogger	S.O.	1346
	I.S.	1031
	M.N.	979
	T.D.	1230
	K.H.	1045
	Mean	1126.2
	S. D.	138.9
Total	Mean	1028.6
	S. D.	157.3

Jogging to music with headphone

Subject		Distance (m)
Novice Jogger	S.S.	900
	H.T.	1132
	K.T.	988
	H.H.	1107
	H.Tk.	950
	Mean	1015.4
	S. D.	89.8
Experienced jogger	S.O.	1356
	I.S.	1144
	M.N.	1064
	T.D.	1156
	K.H.	1074
	Mean	1158.8
	S. D.	105.2
Total	Mean	1087.0
	S. D.	121.3

REFERENCES

1) Borg, G.A.V., Perceived exertion : a note on "history" and methods, Med. Sci. Sports. 5 (2) : 90−93, 1973.

2) Mark, H.A., and D.Q. Marisi, Effect of music and rhythm on physical performance, Res. Quart. 49 (2) : 109−113, 1978.

3) Skinner, J.S. et al., The validity and reliability of a rating scale of perceived exertion, Med. Sci. Sports. 5 (2) : 94−96, 1973.