

Dalcroze Eurhythmics as Agent to Induce a State of Flow in Older Adults

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Abstract: Music-making under the perspective of the theory of flow by Csikszentmihalyi, considers the person actively engaged in a physical, emotional, or intellectual interaction with the environment. The objective of this study was to measure the psychometric properties of the adapted Spanish version of the Dispositional Short Flow State Scale-2 (SDFSS-2) and to evaluate the presence of the state of flow after an intervention of ten weekly sessions of Dalcroze Eurhythmics (DE) in a sample of older adults ($N = 41$) with pre and post measures. During the intervention, the participants listened, felt, and expressed music through motor skills. The factor structure of the SDFSS-2 included two factors: (1) focus enjoyment, (2) challenge-awareness. The indicators of factor 2 related sense of control, and loss of self-consciousness showed statistically significant differences in the Wilcoxon test. Dalcroze Eurhythmics was moderately effective as an agent leading to a state of flow in this sample. With the increase of the population of older adults worldwide, DE constitutes a valuable option to be considered as an ecological, non-pharmacological intervention for this age group in public health systems.

Keywords: music, rhythm, optimal experience, wellbeing.

1. Introduction

Among the current trends in music education are those which address music teaching for individuals with special needs. Among such groups the elderly population presents special challenges for music educators because the diversity of this group varies among those individuals who are healthy in every dimension of their lives to those who might have severe decline in one or various domains: physical, cognitive, emotional. Nevertheless, there are successful music programs for the elderly. Besides the work accomplished in individual instrumental instruction, choral and instrumental ensembles from the music pedagogy perspective, this population experiences positive non-musical benefits in the three dimensions of their lives thanks to music making[1]

Among the positive benefits of music making in the lives of older adults are those related to the self-perception of wellbeing through the highly satisfying experience of making music individually or in groups [2] A very unique joyful experience named *state of flow* has been studied in several areas of music making and within a variety of contexts and populations. Since flow experiences happen in a positive context according to the original concept of Csikszentmihalyi, these experiences contribute to the self-perception of wellbeing[3].

2. Review of literature

In the area of music-making, there are studies which suggest that flow may be experienced by different populations and in different contexts such as children in a music classroom [4][5][6] professional musicians [7], and amateurs [8].

Flow theory and research under the theoretical framework of positive psychology, has its origins based on the need to understand and explain the natural intrinsically motivated phenomenon called flow. This phenomenon is self-fulfilling and is obtained as a result of the execution of a specific activity, even though there is no external benefit obtained for doing it [9].

Csikszentmihalyi, describes the qualities which make activities enjoyable. Those qualities are: the ability to concentrate on a limited stimulus field, the use of individual skills to meet clear demands of the task, the forgetfulness of one's separate identity by becoming one with the activity, and the feeling of control over the environment; furthermore, flow experiences seem to occur only when the person is actively engaged in a clear physical, emotional, or intellectual interaction with the environment [3]

In order to articulate the construct of state of flow, Jackson and Marsh [10] divided it into nine components which may vary in intensity during a specific context. Those components are: (1) union between the action and consciousness of execution, (2) agreement of the abilities of the person with the challenges of the activity, (3) clear and definite goals, (4) immediate and clear feedback, (5) concentration, (6) sense of control,

(7) loss of self-consciousness, (8) distortion of time perception, (9) autotelic or gratifying experience. In the specific context of music-making the individual is actively engaged with the environment physically, cognitively, and emotionally. Therefore, an optimal experience or flow is very likely to occur.

In the specific context of Gerontology, there are studies in relation to the interaction of the individual with the environment during music-making and its positive benefits in three areas: physical [11], emotional, [1][12], and intellectual [13]; nevertheless, these studies do not measure specifically the presence of flow during musical activities in the elderly.

A music teaching approach used in Gerontology is Dalcroze Eurhythmics or Rhythmics created by the Swiss music pedagogue and composer Emile Jaques-Dalcroze (1865-1950). From a holistic standpoint, Dalcroze Eurhythmics is based on rhythmic training through body movements (Jaques-Dalroze, 1921; Nedelcut, 2009) and is divided into four areas: Rhythmics (Eurhythmics), Solfège Rhythmique, Improvisation, and *Plastique Animée* (this area of study works on the body representations of the essence of a piece of music).

Nowadays the therapeutic aspect of Eurhythmics in Gerontology has been broadly practiced throughout Europe and some places in the United States [14], Australia [15], and Canada [16]; however, Switzerland is the only country in the world where a program for seniors is well established. The Institut Jaques-Dalcroze in Geneva provides services to a population of close to one thousand elderly persons regularly attending Eurhythmics sessions in one of its three programs [17].

Since the beginning of the XXI century, researchers have conducted studies in relation to the effects of Dalcroze Eurhythmics in different domains of the lives of older adults: physical and psychological. In the Swiss study of Kressig and AllaiBeauchet (2005) stride time was chosen to be the main outcome of gait parameter being associated to falls. The Dalcroze group that had been taking weekly Eurhythmics classes for forty years did not show a significant variability in the same dual task compared to the control group. Similarly Trombetti et al [18] after a six month-intervention program of Dalcroze Eurhythmics found that there was a reduction in stride length variability under dual task conditions, fewer falls, and a lower risk of falling in the intervention group compared to the results of the delayed intervention group. In parallel, in this study group, the functional and independence capacities were maintained, their anxiety levels lowered, and social relationships improved. Continuing a study of Trombetti, Hars, Hermann and Kressig (2011), Hars, Herrmann, Fielding, Reid, Rizzoli, and Trombetti, et al [19] conducted a longitudinal study of a sample of 52 older adults divided in two groups over four years. The outcomes suggested that the experimental group had more ease at walking and balance than the control group. Results of an exploratory study by Treviño and Álvarez[20], suggest that Dalcroze Eurhythmics was a very enjoyable activity for the subjects and their experience was highly satisfying.

During the DE sessions the participants listen, feel, and express the music (either recorded or improvised by the practitioner at the piano) with their body movements, developing their innate musicality by the activation of positive and negative affectivity through expressive motor representations [21]. By feeling the body as a musical instrument, the person feels and transmits musicality through the stimulation of motor skills [22]. Furthermore, through greater cognitive complexity of his emotions acquired by music and movement, the individual is invited to experience an emotional catharsis, thus liberating himself emotionally [23].

After the selection of a subject or theme for the session, the practitioner designs the activities in a carefully sequenced manner. A series of exercises directed by the practitioner, starting with an introductory phase, performed individually and in groups, is executed by the participants in order to achieve proficiency in a specific skill: rhythmic, melodic, formal, expressive [24]. With the integration of body movements to music education, the perception of sensory information increases, thus creating musical perceptions. Once those perceptions are received, the mind organizes them through reflection and analysis [25]. This reflection-in-action process happens within seconds whilst the participants attempt to improve their performance according to the demands of the music and the instructions given by the practitioner [26]. This process requires the mind and body to be maintained in a state of attentiveness towards the interaction of musical elements [27].

The purpose of the present study was to measure the psychometric properties of the Spanish version of the Short Dispositional Flow State Scale 2 in a sample of Mexican older adults, and to determine to what extent this sample of elderly persons experienced a state of flow during an intervention program of DE.

3. Design and Method

This study has an exploratory design. The subjects were recruited from an inpatient 24/7 permanent geriatric residence in the Monterrey metropolitan area, which provides daily sanitary services, meals, and recreational activities. All subjects and legally responsible family members were given both verbal and written information about the nature of the study, prior to responding to the written questionnaires. The study procedures were undertaken according to ethical principles with the understanding and written consent of each subject. The study protocol was reviewed and approved by the ethics and research committee at the Facultad de Psicología, Universidad Autónoma de Nuevo León. Anonymity was guaranteed throughout the process, as well as

confidentiality of physical data. Completion of the entire battery of tests took an average of twenty minutes prior to the intervention and ten minutes after the intervention.

The intervention consisted of ten sessions of DE. Each session lasted one hour and had six stages: (1) free stretching exercises with and without music; (2) movement sequences with a given pulse and tempo (speed) variations: in this activity the subjects listened to different beat groupings (2, 3 or 4) and touched different parts of their bodies while they imitated and proposed new movement sequences; (3) walking patterns in groups of three and four beats; (4) walking at different tempi and changing direction along with musical phrase beginnings (5) auditory discrimination through the realization of a specific body movement after listening to a precise aural stimulus, and (6) one of the following: free movement improvisation, group dance, hand games, or song singing.

3.1 Instruments

Prior to the intervention the subjects responded an analytical-type structured questionnaire (closed-ended questions and multiple response alternative), which included socio-demographic characteristics; he Spanish version of the Short Dispositional Flow State Scale (SDFSS-2) was completed after this questionnaire and prior to the intervention; the Short Flow State Scale (SFSS-2) was completed post-intervention.

Both the SDFSS-2 and the SFSS-2 are composed of nine positively keyed items which are evaluated along a three-point Likert-type scale (1 = never, 2 = sometimes, 3 = always). Each item represents one of the nine components of the state of flow mentioned previously. The sum of these items yields a total score where higher scores represent a greater degree of the presence of flow. The SDFSS-2 directs thoughts to a specific context experienced previously by the subject and measures his disposition to experience flow. On the contrary, the SFSS-2 refers to a specific activity being studied. In this case, the activity was Dalcroze Eurhythmics (DE). A back and forth Spanish-English translation was carried by the Languages Department of the School of Philosophy and Languages of the Universidad Autónoma de Nuevo León and the Instituto Mexicano Norteamericano de Relaciones Culturales. This translation was followed by committee review and cognitive testing to ensure a translation both culturally and linguistically appropriate [28] Responses to the two language versions were compared to evaluate equivalence and assess the reliability and validity of both versions.

Statistical Analysis

All data were analyzed with SPSS® software (version 24.0) and all tests were performed considering $p < 0.05$ statistical significance. The dimensional structure of the SDFSS-2 was performed with exploratory factor analysis. This statistical method is used to describe how the observed, correlated variables are grouped in various axis in terms of fewer factors (unobserved variables). The internal consistency of the scale was determined by Cronbach's alpha coefficient. This value means that different items asking similar questions obtain similar answers and are correlated with each other with values > 0.30 . Consistency was interpreted as high when it expressed a value equal or > 0.70 .

4. Results

The sample included 41 older adults age ($M = 82.5, \pm 7.9$ years): 30 female and 11 male with an average of 9.9 years of education ($SD = 3.87$). The internal consistency of the SDFSS-2 scores is considered acceptable ($\alpha = 0.78$) as well as that of individual items, except item 4 (unambiguous feedback) since its deletion increased Cronbach's alpha coefficient to $\alpha = 0.81$. Items' corrected correlations ranged from 0.36 to 0.69. Initial communalities varied between 0.62 and 0.93; all items had reliable psychometric properties.

The values of the correlation matrix of the 8 items of the SDFSS-2 scale are considered to have adequate properties for factor extraction. Two factors were extracted and found with acceptable internal consistency, which accounted for 69.4% of the total variance. The first factor labeled "focus enjoyment" was integrated by four items (items 3, 5, 8, and 9) related to clear goals, concentration, transformation of time, and autotelic experience. The second factor labeled "concentration awareness" was integrated by four items (items 1, 2, 6, and 7) related to challenge-skill balance, action-awareness merging, sense of control, and loss of self-consciousness (See Table 1).

Table 1. Rotated component factor matrix

Indicator	Factor 1 (a)	Factor 2 (b)
Concentration	.925	
Transformation of time	.828	
Autotelic experience	.789	
Clear goals	.788	
Challenge/skill balance		.964

Action-awarenessmerging	.937
Loss of self-consciousness	.673
Control	.551

Note: The grouping of indicators in two factors is in descending order according to factorial loads.

- (a) Factor 1: “focus-enjoyment”; items 5, 8, 9, and 3.
- (b) Factor 2: “challenge-awareness”; items 1, 2, 7, and 6.

The correlations between the eight items were low to strong ($r = 0.04 - 0.94$). The items related to balance between challenge and skill and action merging and awareness were the ones which values were the highest in terms of level of correlation ($r = .941$). This first indicator also registered a strong level of correlation with that related to loss of self-consciousness ($r = .629$) which in turn correlated with action merging ($r = .482$) and transformation of time ($r = .469$). Action merging correlated positively with control ($r = .476$) and transformation of time correlated strongly with concentration ($r = .852$). Moreover concentration correlated strongly with clear goals ($r = .687$) and autotelic experience ($r = .650$). This last indicator also correlated with transformation of time ($r = .587$) and clear goals ($r = .514$). See Tables 2a and 2b.

Table 2(a) Correlation matrix

	Challenge skill balance	Action merging	Clear goals	Concentration
Challenge-skill balance	1.000	.941	.087	.260
Action-awarenessmerging	.941	1.000	.064	.251
Clear goals	.087	.064	1.000	.687
Concentration	.260	.251	.687	1.000
Control	.400	.476	.191	.176
Loss of self-consciousness	.629	.482	.242	.379
Transformation of time	.259	.254	.439	.852
Autotelic experience	.133	.262	.514	.650

Table 2(b) Correlation matrix

	Loss of self-consciousness	Transformation of time	Autotelic experience
Challenge-skill balance	.629	.259	.133
Action-awarenessmerging	.482	.254	.262
Clear goals	.242	.439	.514
Concentration	.379	.852	.650
Control	.147	.152	.209
Loss of self-consciousness	1.000	.469	.049

Transformation of time	.469	1.000	.587
Autotelic experience	.049	.587	1.000

The results of the Kolmogorov-Smirnov and Shapiro-Wilk ($p = .000$) mean the values of the scale studied are not distributed normally; therefore the measurements are non-parametric. The score range for the eight items varies from 1 to 3 ($M = 20.34$, $SD = 2.3$). Mean scores of individual items were ranged from 1.63 to 2.90. The indicator related to loss of self-consciousness was the one which had the lowest initial value ($M = 2.05$) and end value ($M = 1.63$) in contrast to autotelic experience which registered the highest initial value of ($M = 2.88$) and highest end value of ($M = 2.90$). The items related to action merging and awareness ($M = 2.17$; $M = 2.68$), concentration ($M = 2.83$; $M = 2.88$), and control ($M = 2.54$; $M = 2.73$) besides autotelic experience mentioned earlier, were those which registered higher mean values post intervention. In contrast, the variables related to balance of challenge-skill ($M = 2.20$, $M = 2.17$), clear goals ($M = 2.78$; $M = 2.63$), transformation of time ($M = 2.90$; $M = 2.76$), and loss of self-consciousness mentioned above, registered lower mean values post intervention compared to those previous to it. See Table 3.

Table 3. Comparison of means pre and post intervention

Pairs of indicators	N	Mean value PRE	Mean value POST
Challenge-skill balance	41	2.20	2.17
Action-awarenessmerging	41	2.17	2.68
I had a strong sense of what I wanted to do	41	2.78	2.63
I was completely concentrated in class	41	2.83	2.88
I had a feeling of total control of what I did	41	2.54	2.73
I did not worry about what others thought of me	41	2.05	1.63
The way time passed was different from usual	41	2.90	2.76
My experience has been highly satisfying	41	2.88	2.90

The results of the Wilcoxon test had statistical significant differences between paired components related to sense of control ($p = .021$) and loss of self-consciousness ($p = .000$). See Table 4.

Table 4. Wilcoxon Test

	Sense of Control	Loss of self-consciousness
Level of significance (bilateral)	.021	.000

5. Discussion and Implications

Csikszentmihaly's [3] initial description of the flow experience, states that this optimal experience exists solely when the person is in active interaction with the environment in a physical, emotional, or intellectual way. As stated before DE is a musical activity which encompasses music-making from a holistic standpoint by working on the physical, cognitive, emotional, and social domains of the individual. In relation to

this idea, and after the results of the factor analysis of the SDFSS-2 the items 3 (clear goals), 5 (complete concentration), 8 (different time perception), and 9 (gratifying experience) were grouped under the name “focus enjoyment.” Item 9 reads “my experience was highly satisfying” and is understood as a consequence of being completely concentrated in the session (item 5) knowing exactly what to do (item 3); therefore, losing the sense of time (item 8).

In comparison, the second factor comprises item 1 (balance between challenges and skill), item 2 (spontaneity), item 6 (total control), item 7 (loss of self-consciousness) labeled “challenge awareness.” This factor suggests that when the individual perceives his skills at an adequate level to perform the activities of the sessions, he has a sense of control over them; therefore, he performs them with ease or spontaneity, and it is unimportant what others think about him or his performance.

In relation to the aim of this study to analyze the effectiveness of DE to lead to a state of flow in this sample of older adults, the statistical results suggest that in fact, there is a significant difference after the intervention in three of the components of the state of flow in relation to the scores prior to the intervention. The scores of the Wilcoxon test showed statistical significant differences between the following paired SFSS-2 components: “loss of self-consciousness” (No.7), and “sense of control over the activity” (No.6). For this reason and in agreement with Csikszentmihalyi’s [3] idea describing flow as a phenomenon mainly present in play in the form of games which are activities enjoyable and fun in themselves, it is important to emphasize that DE strategies during the sessions are designed to stimulate a joyful musical experience. In fact in some cases, such teaching strategies are called “games” and are designed by the practitioner [29] according to the musical and physical skill level of the group. This way, the participants perceive they can perform the activities successfully and have a sense of control over them. When a person is immersed in a joyful activity, he changes his attentional processes and directs his attention towards a specific stimulus [30].

In DE sessions the focus of attention of the participant is directed towards a specific musical element which is worked through in a precise exercise or game. This way, there is a higher probability for the participants to merge in the activities or “games”, have control over them, lose self-consciousness, and as a result experience a state of flow [31].

This result might be explained by the fact that during DE sessions for older adults, the goal is neither to achieve perfection nor precision, musically or physically, rather it is to enjoy the overall musical activity in the three areas: physical, emotional, and intellectual, regardless of the quality of the outcome. For this reason, the practitioner neither corrects the performance of the group nor assesses it in any strict manner. Thus these results which showed statistical significant differences in three factors related to control, and lose of self-consciousness, suggest that DE sessions were effective to induce a state of flow at a moderate level in this sample of older adults.

At a closer observation of the descriptive analysis of the SFSS-2, it is important to notice that mean scores of the factor “focus enjoyment” which comprises 4 items: items 3 (clear goals), 5 (concentration), 8 (transformation of time), 9 (gratifying experience) and those of item 2 (action awareness) and item 6 (sense of control) which belong to the factor “challenge-awareness” scored between 2.78 and 2.90 which is in the range between “sometimes” and “always.” These results are in agreement to the idea presented above in relation to Csikszentmihalyi’s original definition of flow described as a dynamic optimal experience in which the subject perceives a deep sense of control over a specific activity while being completely immersed in it without a reflective consciousness about it [32], while focusing his attention on a specific stimulus field.

Furthermore it is important to underline that even though item 5 (concentration) did not have a statistically significant difference after intervention, the mean score was higher than that prior to the intervention. This result is in accordance to the scores of item 2 (action merging): when a person is completely concentrated on a task he merges or becomes one with the action [33].

In contrast, the mean scores of items 1 (challenge-skill balance), and item 7 (loss of self-consciousness) after the intervention which belong to factor “challenge-awareness” are $M = 2.17$ and $M = 1.63$ respectively which is in the range of “sometimes.” It is interesting to notice, however, that items 6 and 7 had statistically significant differences post intervention and both of them are related to ideas of freedom and spontaneity.

These results suggest that subjects perceived they had control over the activities, since they were practicing the exercises as the weeks passed by and felt more comfortable doing them. Once that happens, the person begins a process of a certain degree of automatization of motor responses; therefore, he does not have to think about it a great deal [34].

This idea is in accordance with the decrease in the mean score of item 7 related to loss of self-consciousness which read “I did not worry about what others thought of me” which may be interpreted as an increase of consciousness or awareness about others in the group as time went by. Moreover, the mean of item 1 which read “I felt competent enough to meet the challenges of the class” related to challenge/skill balance also decreased at the intervention which suggests an awareness of the need to practice or repeat the activities several

times in order to achieve competence. Since the mean score of item 9 related to enjoyment increased after the intervention, possibly the participants influenced each other positively by looking at each other having fun during the sessions even though, the final result was not “perfect,” and though this item did not have a statistically significant difference after it. As stated before, the goal of DE for populations of older adults is to have a joyful musical experience rather than the pursuit of perfection (physical or musical).

This notion is in agreement as well to the decrease in the mean score of item 8 after the intervention which read “the way time passed was different than usual.” Since the participants were enjoying the sessions probably they did not want them to end; therefore, were more aware of time.

These results suggest that regardless of the fact that most of the participants did not perceive to have skills that matched the challenges of the DE activities, they still had an optimal experience or flow with moderate intensity as reflected in the overall results.

The results of this study illustrate the need for more research around the benefits of DE in populations of older adults in the emotional, cognitive, and physical domains. Since flow experiences contribute to the self-perception of well-being [35] and musical experiences do the same in populations of older adults as mentioned earlier, the likelihood is that DE might improve the self-perception of well-being in this population since flow experiences and musical experiences have suggested to contribute in this manner for this study group.

Given the fact that the population of older adults is increasing considerably worldwide and therefore, there is an urgent need to find new ecological, non-pharmacological interventions for this age group [36]. Among such interventions there are studies which illustrate that activities addressed to the cognitive and physical domains encourage the adoption of healthy lifestyles among older adults[37]. Nevertheless, such interventions must be framed by a theoretical background which gives direction to their implementation and increases the probabilities of success [38]. Musical activities [2] and in particular those with a holistic approach such as Dalcroze Eurhythmics constitute a valuable option to be considered by health care systems to be included in their action plans to benefit the population of older adults in general. As mentioned in the introduction of this paper, musical activities provide positive benefits in various domains of life in the population of older adults. Besides learning new skills in a specific area of music making and remaining active physically, cognitively, and socially, the interventions of musical activities provide a valuable non-invasive, non-pharmacological and ecological source of interventions for this population to improve their overall wellbeing in their later stages of life.

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