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The Effect of the Flotation Version of Restricted Environmental Stimulation Technique (REST) on Jazz Improvisation

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Abstract

The flotation version of restricted environmental stimulation technique (REST) has been shown to improve perceptual-motor skills in sports and creativity in the sciences. We examined whether these effects would extend to jazz improvisation—an activity involving perceptual-motor coordination and creativity. College students enrolled in an intermediate-level jazz improvisation class (N = 8) floated for one hour per week for 4 consecutive weeks. The comparison group (N = 5) consisted of student volunteers enrolled in the same class who did not engage in flotation. The dependent variables were (a) blind ratings of improvised pieces collected before and after treatment, (b) instructors' ratings of perceived change in improvisational ability, and (c) final class grades. Both blind and perceived change measures demonstrated higher scores on technical ability in the flotation group. The flotation group also had higher final class grades. The results suggest that flotation REST can improve perceptual-motor skills in jazz improvisation.

Keywords

creativity, flotation REST, improvisation, jazz, relaxation

Improvisation is one of the distinct skills defining musical performance.[1] There are 2 variants of improvisation: stylistically conceived and freely conceived. Whereas the former reflects improvisation with respect to a given theme or motif, the latter reflects improvisation that is not determined by any stylistic parameter. In this study, we were interested in freely conceived improvisation, which as a skill can be defined in terms of 3 components: instrumental fluency, creativity, and musical quality. Interventions leading to improvements in any of these 3 components should prima facie improve freely conceived improvisation. Interestingly, the flotation version of the restricted environmental stimulation technique (REST) has been shown to enhance instrumental fluency (ie, perceptual-motor skills) in sports and creativity in the sciences. Therefore, this study was conducted to test the hypothesis that flotation REST would improve the instrumental fluency and creativity components of freely conceived jazz improvisation.

Flotation REST

Flotation REST entails floating in a dense, warm solution of Epsom salts within a dark, sound-reducing tank (see Figure 1). It is designed to reduce contact with external stimuli and has been shown to induce a state of relaxed alertness, concentration, and reduced stress.[2-4] Physiologically, flotation REST appears to bring about this state via 2 routes. First, flotation REST[5-7] has been shown to reduce plasma cortisol by 21.6% and plasma cortisol variability by 50.5%. Second, flotation REST has also been shown to lead to reduction in vanylmandelic acid in plasma and urine.[8] These findings suggest that the psychological state of relaxed alertness, concentration, and reduced stress associated with flotation REST may be a function of its impact on the body's stress response.

There is also some evidence to suggest that flotation REST may affect interhemispheric dynamics in the brain. Suedfeld et al,[9] in a review of the flotation REST literature on a wide variety of topics, suggested that the effects might be explained by a rebalancing of hemispheric dominance, such that the normally nondominant cortical hemisphere becomes more active and exerts greater influence over psychological processes (the dynamic hemispheric asymmetry hypothesis). The hypothesis is compatible with the findings of Raab and Gruzelier,[10] who administered a haptic processing test and the Warrington Recognition Memory test[11] to participants before and after a 90-minute flotation session and to participants in a control group who did not float. The haptic processing test involved sorting objects by touch while blindfolded, separately

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Figure 1. The flotation tank.

for each hand. This is an ''active touch'' task controlled by the contralateral hemisphere. The results demonstrated greater improvements in sorting times for the left hand in participants in the flotation group, suggesting relative processing enhancement in the right hemisphere. In addition, the results of the Warrington Recognition Memory test demonstrated improved memory for faces but not for words in the flotation group. To the extent that memory for words and faces is preferentially processed in the left and right hemispheres, respectively, the results from this test also point to relative right hemispheric processing enhancement following flotation REST. However, the hypothesis that flotation REST affects interhemispheric dynamics remains to be tested directly using physiological methods.

The effects of flotation REST have been studied on a wide array of psychological and physical activities. Two of its beneficial qualities in particular were of importance here. First, flotation REST has been shown to enhance performance in a variety of athletic tasks that require attention, concentration, and perceptual-motor coordination such as gymnastics,[12] tennis,[13] dart-throwing,[14] and basketball.[4,15] Because musical performance also involves perceptual-motor coordination, our first hypothesis was that the beneficial effects of flotation REST would extend to perceptual-motor skills in jazz improvisation.

Second, flotation REST has been shown to facilitate creative cognition. For example, Suedfeld, Metcalfe, and Bluck[16] demonstrated that six 90-minute sessions of flotation REST resulted in the generation of more creative ideas among university professors.[17,18] Given that jazz improvisation represents a prime medium for assessing musical creativity, our second hypothesis was that the beneficial effects of flotation REST would extend to creativity in jazz improvisation.

Methods

Participants

A total of 13 students (9 males and 4 females) enrolled in an intermediate-level jazz improvisation course in the Music Department of the Vancouver Community College expressed interest in taking part in the study on ''the effects of flotation REST on jazz improvisation'' (see note 1). The average age of the sample was 23.6 (SD = 3.5). Their instruments consisted of bass guitar, electric guitar, saxophone, flute, keyboard, violin, and voice. Eight of the students (6 males and 2 female) were assigned to the treatment group. The remaining 5 students (3 males and 2 females) whose schedules did not allow them to complete 4 repeated flotation sessions on 4 consecutive weeks comprised the comparison group. Students in the comparison group were promised flotation sessions after the completion of the study. Participants were instructed not to discuss their status (treatment vs comparison) with their instructor or other students.

Materials and Procedure

The flotation tank is a light-proof, sound-reducing fiberglass shell (see Figure 1). It contains a solution of Epsom salts and water, 30 cm deep, the density of which allows the participant to float in a supine position with the face and the ventral part of the body remaining out of the water. The solution is kept at skin temperature (35.5°C-37.0°C), and earplugs are worn during the flotation session. An experimenter monitors each session over an intercom. Before and after the completion of the one-hour flotation session, the participant takes a shower and shampoo.

Participants in the treatment group floated for one hour on the same day of the week for 4 consecutive weeks. Although the one-hour session is considered standard in the literature, the number and timing of sessions has varied (see Suedfeld[19]). Given that prior research[4,5] had varied the number of REST sessions between 1 and 8, 4 sessions were considered a moderately intense protocol.

All participants completed a 5-minute recording session one week prior to the start of flotation sessions. These recordings constituted the pretreatment (ie, baseline) performances. For these recordings, the participants were placed individually in a room and asked to engage in freely conceived improvisation for 5 minutes. No improvisational parameters or expectancies were set for the participants, and they were ''encouraged to perform in any style or mood they choose and to let their imagination 'roam freely.'''[20(p14)] This procedure was followed

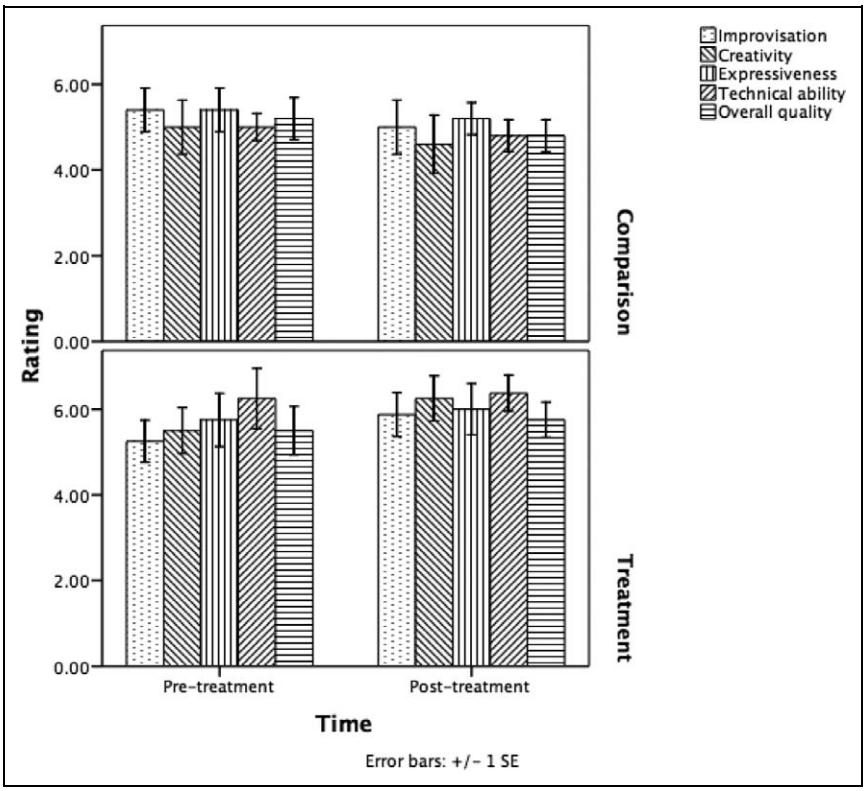

Figure 2. Pretreatment and posttreatment ratings on improvisation, creativity, expressiveness, technical skill, and overall quality.

again one week after the completion of the 4-week flotation session, which in turn constituted the posttreatment performances. In other words, for both groups the pretreatment and posttreatment recordings were made one week prior to the beginning and one week following the termination of the same 4-week period during which the treatment group engaged in flotation REST.

Results

At the end of the experiment, each 5-minute piece was rated by the jazz improvisation class instructor on 5 dimensions: improvisation, creativity, expressiveness, technical ability, and overall quality. These dimensions were chosen to closely reflect the criteria used by McPherson.[20,21] Ratings for each dimension were done on a separate 11-point scale, ranging from 0 (*Poor*) to 10 (*Excellent*). These ratings generated 5 pairs of scores for each participant. The instructor was blind regarding the order of the recordings (pretreatment vs posttreatment) or the students' status (treatment vs comparison) in the experiment.

We also collected 2 additional measures. First, at the end of the 4-week experiment, the instructor was asked to report whether he had noticed any changes in the participants' improvisational performances compared to a month earlier, before the start of the experiment. Each student was rated on the same 5 dimensions (improvisation, creativity, expressiveness, technical ability, and overall quality). The ratings were done on separate 7-point scales for each dimension, ranging from –3 (*significant negative change*) to +3 (*significant positive change*). These ratings will be referred to as *perceived change ratings*. Second, with the agreement of the students, the instructor also provided the experimenters with each participant's final jazz improvisation class grade.

Five independent sample t tests were conducted to determine whether the treatment and comparison groups differed on any of the pretreatment scores on any dimension. The results demonstrated that there was no significant difference between the treatment and comparison groups on any of the pretreatment dimensions (Figure 2).

A separate analysis of covariance (ANCOVA) was conducted for each of the 5 improvisation components, using the posttreatment score as the dependent variable, the pretreatment score as the covariate, and the status of the participant (treatment vs comparison) as the grouping variable. The results revealed a significant difference between the experimental and comparison groups on technical ability, $F(1, 10) = 5.57$, $P < .05$, $\eta^2 = .36$, but not on any other dimension (Figure 2). Converging on the same results, 5 independent sample t tests using the perceived change ratings as the dependent variable and the participants' status (experimental vs comparison) as the independent variable demonstrated a significant difference between the treatment and comparison groups on technical ability, $t(11) = 2.42$, $P < .05$, but not on any other dimension (Figure 3). Finally, the treatment group (91%) had significantly higher grades in the jazz improvisation class than the comparison group (85%), $t(11) = 2.66$, $P < .05$.

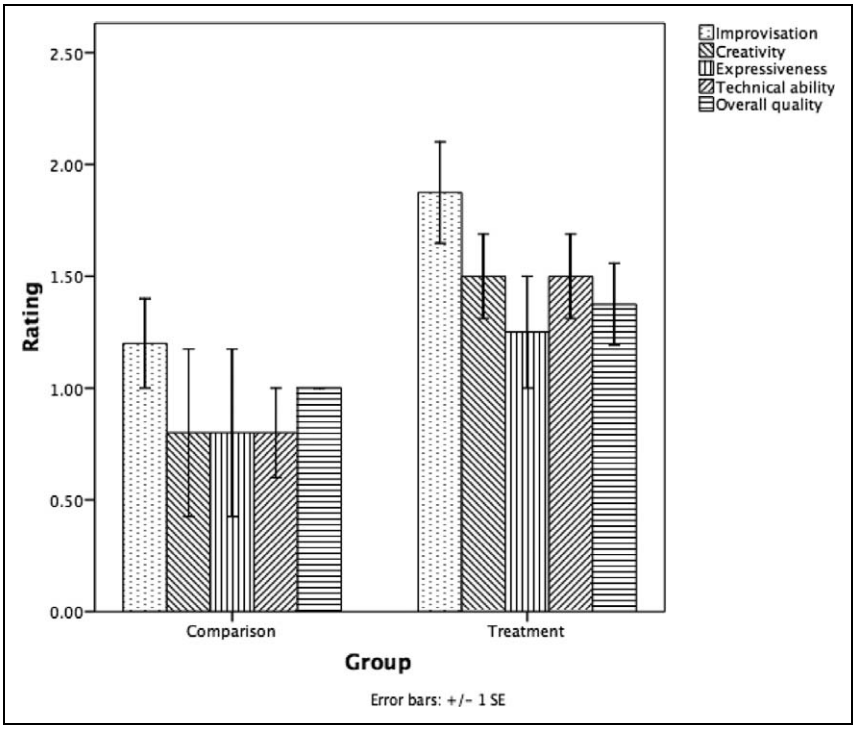

Figure 3. Instructor's perceived change ratings on improvisation, creativity, expressiveness, technical skill, and overall quality.

Discussion

The results of this study suggest that a 4-week regimen of flotation REST had a beneficial effect on technical ability in freely conceived jazz improvisation. Despite the small sample size, 2 measures add some confidence to the findings. First, both groups were composed of students who had volunteered to take part in the study. This, combined with the fact that the pretreatment scores demonstrated no difference between the 2 groups on any of the 5 dimensions, suggests that the 2 groups can be considered equivalent in terms of motivation and baseline ability. Second, because at the end of the study both dependent measures showed that technical ability was the only component on which the 2 groups differed, one can view this convergence of evidence as an indication that flotation REST had a specific effect on a single component of jazz improvisation.

Why is it that flotation REST did not have an effect on creativity in freely conceived jazz improvisation? There could be a number of reasons. First, Suedfeld et al[16] assessed creativity immediately following the completion of flotation sessions. In contrast, we collected posttreatment recordings one week following the completion of the final flotation session. It is possible that the effect of flotation on creativity may have subsided due to the relatively longer time delay between the final flotation session and posttreatment assessment. However, it is important to note that we implemented this design feature purposefully because we were interested in the long-term accumulated effects of flotation on jazz improvisation, rather than its immediate effects. Second, the absence of an effect on creativity may have been due to how creativity is manifested in the performing arts. Specifically, Kogan[22] has argued that whereas creativity is usually viewed as the production of novel and useful products, in the performing arts the emphasis may be on the novel *interpretation* rather than the creation of pieces. This suggests that whereas the beneficial effects of flotation REST may manifest themselves when the focus is on the generation of novel and useful ideas,[16] the benefits may not extend to the interpretive aspects of creativity. Finally, to the extent that creativity is a function of brain activity (eg, Fink et al[23]; Goel & Vartanian[24]; Howard-Jones et al[25]), a better understanding of the neural dynamics of flotation REST is needed before its long- and short-term effects can be segregated.

The most important limitation of our study is its small sample size. Future attempts at replication would benefit from recruiting a larger number of participants to increase the statistical power to detect possible weak but nevertheless reliable effects. In addition, future studies on this topic can obtain relevant physiological measures (eg, electroencephalography, heart rate) during flotation not only to ascertain the experience of reduced arousal but also to test the hypotheses about potential physiological mediators. This will contribute to a better understanding of the mechanisms whereby flotation REST achieves its effects.

Despite these limitations, our results contribute to a small but growing literature focusing on the effects of relaxation interventions on musical performance, rather than the use of music as a relaxation tool. Furthermore, whereas most work in this area has focused primarily on the effects of relaxation interventions on the reduction of performance anxiety during musical performance, our results hold the promise of using flotation REST as a technique to improve specific components of musical performance—in this

case technical skill. Should the effect reported here be verified in a larger study, it will contribute to a small but growing literature on the effects of relaxation intervention and related methods such as biofeedback and hypnosis on a specific component of musical performance (see Egner & Gruzelier[26]).

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Note

1. The intermediate level course focuses ''on jazz and Latin standards and some jazz fusion repertoire. Students gain facility with all scales/modes/arpeggios, key modulations, chord/plural substitutions, pan modal concepts and certain modes of the jazz melodic minor scale and their application to altered dominant chords.'' For further information consult http://www.vcc.bc.ca/music/.

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Bios

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