

## Time-Clamped, RPE-Matched Treadmill Activity and Interactive Video Game Dancing Differ in Step Count But Not Heart Rate Response

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### ABSTRACT

**Background:** Participation in regular moderate or vigorous physical activity (MVPA) results in numerous health benefits. Task enjoyment is a known antecedent and promoter of regular activity engagement. Participation in interactive video gaming has increased in recent years. **Purpose:** The aims of the present investigation were to: 1) determine heart rate (HR) and step count outcomes of time-clamped and RPE-matched interactive video game dancing (VGD) and treadmill activity; 2) characterize the suitability of VGD to achieve MVPA designation; and, 3) investigate step count outcomes recorded by pedometry and accelerometry. **Methods:** Subjects underwent three testing sessions with the latter two randomized. During the familiarization visit, the perceived exertion (Borg RPE) of an interactive VGD activity was determined and a treadmill speed that resulted in an RPE-matched exertion level was identified through incremental increases in treadmill speed. On subsequent visits, subjects completed 15 minutes of VGD or RPE-matched treadmill activity. HR and step count were measured during both sessions. **Results:** Nine participants (Age  $19.8 \pm 1.6$ ; 5 males; 4 females) volunteered. With time-clamped and RPE-matched, the average HR for dancing  $154.7 (\pm 21.8)$  and treadmill activity  $157.8 (\pm 25.1)$  were not different ( $p = 0.698$ ). The selected dances for the VGD activity resulted in 8/9 subjects exercising at MVPA intensity according to percent of predicted maximal HR (threshold of 64% maximal HR; equation:  $207 - 0.7 * \text{Age}$ ). Steps completed during dancing and treadmill activity according to pedometry were  $1510 (\pm 488)$  and  $2066 (\pm 247)$ , respectively, with the difference being significant ( $p = 0.001$ ). Steps completed during dancing and the treadmill activity according to accelerometry were  $988 (\pm 256)$  and  $1938 (\pm 119)$ , respectively, with the difference again significant ( $p < 0.001$ ). The within-mode, between-device step count (pedometer vs. accelerometer, respectively) were also of interest. For dancing, a significant difference ( $p < 0.001$ ) was noted as  $1510 (\pm 488)$  vs.  $988 (\pm 256)$  steps. For treadmill activity, the disparity between  $2066 (\pm 247)$  vs.  $1938 (\pm 119)$  was also different ( $p = 0.042$ ). **Discussion:** The HR response of a VGD activity was not different than a time-clamped, RPE-matched treadmill activity. Furthermore, VGD achieved designation as MVPA intensity in 8/9 subjects with the lone subject failing to achieve moderate designation by a single beat. Of note, objectively determined step count varied by mode and measuring device illustrating the need to employ prudence when selecting measuring technique for step count during rhythmic vs. non-rhythmic PA.