Acute Aerobic Exercise and Affect
Current Status, Problems and Prospects Regarding Dose-Response

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Abstract

One of the assumptions underlying recent physical activity recommendations is that lower doses of activity (i.e. intensity and duration) are more enjoyable for the average person, thus leading to higher involvement and adherence rates. However, the veracity of this hypothesis can be questioned, since little is actually known regarding the association between activity doses and affective responses. The few preliminary attempts at the conceptual delineation of the dose-response relationship, all centred around an ‘inverted-U’ notion, are reviewed and criticised.
as lacking empirical foundation. Available meta-analyses, as well as the empirical literature on the role of exercise intensity and duration, are examined.

Increased intensity appears to be associated with reduced positivity of affect during and immediately following an exercise bout. Intensity effects appear to be attenuated during recovery. Fitness and training status appear to become significant mediators of the exercise-affect relationship only at high intensities. With intensity being kept constant, different exercise bout durations have not been shown to have a differential impact on pre- to post-exercise affective changes. Recommendations for future research include: (i) a shift from categorical to dimensional conceptualisations and operationalisations of affect; (ii) the examination of psychological theories on the association between activation and affect (e.g. extraversion-introversion, sensation seeking, type A behaviour pattern and related self-evaluative tendencies, reversal theory, optimal stimulation theory, multidimensional activation theory and self-efficacy); (iii) the systematic and theory-based examination of in-task and post-exercise affective responses; (iv) the incorporation of the parameter of fitness and/or activity status in research designs; and (v) the re-evaluation of methods for selecting exercise intensity levels.

Recent consensus statements and public health recommendations regarding the application of physical activity and exercise as preventive health practices call for moderate doses of activity (i.e. intensity of 3 to 6 METs, for at least 30 minutes, which can be distributed across short intermittent bouts during the day).\[1-3\] This position represents a departure from the credo that fitness enhancement is a prerequisite for health improvement and a transition to the notion that a more ‘active lifestyle’ (i.e. one that entails increased energy expenditure, including both occupational and leisure activities) may be effective at conferring significant health benefits.\[4-8\]

These proclamations have stirred controversy among exercise scientists. On the basis of scientific evidence, the effectiveness of the recommended doses of activity remains questionable.\[9-11\] Consequently, the new recommendations are regarded as being influenced, at least in part, by the need for a public health policy that can be successful in reducing the portion of the population that remains sedentary. This need is highlighted by the limited progress towards the initial Healthy People 2000 targets concerning physical activity.\[12\]

The expectation that the new recommendations will fare better than the more stringent previous ones in getting more people active is based, at least in part, on the assumption that lower doses of physical activity are more tolerable and perhaps more enjoyable than higher doses, and may, therefore, be more easily accepted by a larger segment of the population. A higher degree of enjoyment is, in turn, expected to lead to higher adherence rates.\[1,13-19\] While there is, in fact, some evidence that supports this assumption,\[20-22\] other findings are in conflict,\[23,24\] leading some authors to warn that a secure empirical base is still lacking.\[25-27\]

In general, experience has shown that assumptions regarding the predictability of complex psychological outcomes of physical activity, such as enjoyment and affect, and associated behaviours, such as adherence, are of limited generalisability. The present review will focus specifically on affective changes associated with acute bouts of aerobic exercise of varying dose characteristics, with one of its primary intended functions being to underscore the important distinction between assumptions, even intuitively appealing ones, and reliably documented scientific observations.

Despite rapidly accumulating evidence of affective benefits associated with acute aerobic exercise, operationalised as decreases in anxiety,\[28-30\]