The effect of physical activity on attentional bias to emotions is modulated by age

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Abstract

Background. Physical activity has an impact in biasing attention towards positive or negative emotional stimuli. While it is known that attentional bias to emotions varies with age, evidence is lacking on the effect of physical activity on age-related attentional bias to emotions. **Aim.** The current study tackled this issue by investigating the effect of prolonged physical exercise (half-marathon) on attentional bias to emotions in younger or older amateur runners. **Method.** Under 45 (n=23; mean age ± standard error, 35.52 ± 1.63 years, age range 21-44 years) and over 45 participants (n=23; mean age ± SE, 51.78 ± 1.26 years, age range 45-65 years) took part at the study. The dot-probe task was used to measure attentional bias to emotions before and after a half-marathon. In each trial, a pair of faces, one neutral and the other emotional (happy, angry, sad), was displayed on a monitor to either the left or the right side of a central fixation cross; the face pair disappeared and a dot was shown in place of one of the faces. Participants were asked to indicate the location of the dot by pressing as fast as possible the corresponding key on the keyboard. In this task, attentional bias towards or away from emotions is respectively inferred by the faster or slower reaction times to the dot replacing the emotional than the neutral face. **Results.** Our main findings revealed that the attentional bias to emotions was differently modulated by the running race depending on age. Specifically, under 45 showed an attentional bias towards angry and away from happy and sad faces after the race. This pattern of results was likely due to a congruency effect between the level of arousal induced by the running race and the level of arousal evoked by a specific emotion (anger) in modulating attention. On the other hand, over 45 participants showed an attentional bias away from angry, but no bias for happy and sad faces after the race, likely suggesting a tentative to establish an optimal emotional level after the competition. Moreover, over 45 showed a bias away from happy and sad faces before the race, hinting at a possible emotion regulation mechanism to better focus on the forthcoming competition. **Discussion.** Overall, our findings suggest that the effect of physical activity on attentional bias to emotions is mediated by age-related regulatory processes.