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Opinion

Why people should run after positive affective experiences instead of health benefits

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Box 1. Modeling the effects of health benefits and positive affective experiences on the decision to engage in physical activity (PA)

Imagine a situation in which 2 alternatives are available: a PA alternative (e.g., running) and a sedentary one (e.g., watching TV) (Fig. 1). The chosen option is expected to be the one that has been assigned the highest subjective value (SV). The SV assigned to engaging in a behavior x can be calculated as the sum over all possible states of the world resulting from this behavior (s_i; e.g., being in a good health) of the products of the probabilities of occurrence of this state ($p(s_i)$; distorted by a probability distortion function w) and the value (V) assigned to this state (see Fox & Poldrack[8] for an introduction to similar decision-making models):

$$SV(x) = \sum_{s_i \in x} w(p(s_i)) \times V(s_i).$$

Assuming that obtaining the health benefits of PA is the unique reason to action, the probabilities of being in bad health (p_{risk}) or good health (1-p_{risk}) in the future (delay d) are estimated first, with good and bad health being future states that respectively hold delay-discounted and intangible values (V_d^+ and V_d^-). If and only if it is estimated that being in bad health in the future is probable, then the health benefits of PA are considered. Being active can restore good health in the future ($p_{benefit}$), but it may be insufficient to prevent the development of bad health ($1 - p_{benefit}$). Here, all these probabilistic estimations are affected by beliefs distortion biases (e.g., low odds of being in bad health in the future, motivated skepticism about the benefits of PA on health). When including the costs of PA (c)—which are related but not restricted to physical effort (e.g., discomfort, pain)—in the equation, the SV of PA can be calculated as follows:

$$SV(PA) = -c + (1 - p_{risk})V_d^+ + p_{risk}\left(p_{benefit}V_d^+ + \left(1 - p_{benefit}\right)V_d^-\right).$$

Following the same reasoning as that regarding sedentary alternatives, the equation includes another term for the value V assigned to the related outcome (e.g., the pleasure of watching a TV show), while the cost of effort is removed from the equation:

$$SV(SED) = V_{Sed} + (1 - p_{risk})V_d^+ + p_{risk}V_d^- .$$

When calculating the net difference in SVs assigned to PA and sedentary alternatives, we use the following equation:

$$SV(PA) - SV(SED) = -c - V_{Sed} + p_{risk}(p_{benefit}V_d^+ + (1 - p_{benefit})V_d^- - V_d^-)$$

In this equation, the net difference in SV between PA and sedentary behaviors is mainly dependent on the cost of engaging in PA (e.g., cost of effort) and the value assigned to

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sedentary alternatives. In contrast, the health benefits are only accounted for by a multiplicative term, conditional to several parameters related to delay-discounting effects and beliefs distortions biases. When health benefits are the unique reason for action, they weakly influence decision-making processes selecting between PA and sedentary alternatives. In such a situation, we can easily understand why people tend to watch TV rather than run. Now, say that positive affects are also expected to be obtained from engaging in PA, with a value $V_{affects}$. The equation becomes:

$$SV(PA) - SV(SED) = -c - V_{Sed} + p_{risk}p_{benefit}\left(V_d^+ - V_d^-\right).$$

The balance between PA and sedentary alternatives is now reweighted because another valued outcome is added into the equation: the positive affects that can be expected from engaging in PA. Please also note that, as explained in the main text, positive affects can reduce the perceived cost of PA and may strengthen beliefs about the positive health benefits expected from PA. Overall, positive affective experiences increase the overall SV of PA over sedentary alternatives, which ultimately inclines individuals to run rather than to watch TV.

Of note, although health benefits of PA may hold a low SV in comparison to sedentary alternatives, individuals may still opt for physically active options. Such choices may be the result of self-control mechanisms (i.e., processes through which individuals resist surrounding temptations to complete their long-term goals). Yet, these self-control processes are most likely taxing on an individual's resources, subject to exhaustion and failure over time, and thereby do not guarantee regular engagement in PA. Interestingly, when PA behaviors are also perceived as pleasant, more automatic forms of behavioral regulation are likely to develop. As such, although expecting positive affective experiences from engaging in PA does not cancel out our innate attraction toward sedentary alternatives, it may still contribute to the automatization of decision-making processes, which can ultimately favor a smoother and more sustained engagement in PA.

Over time, physical activity (PA) has shifted from being a necessity to being an alternative. As a result, levels of PA have sharply decreased.[1] Today, we are facing a worldwide pandemic of physical inactivity, with one death every 6 s attributed to insufficient PA.[2] To counteract this trend, a tremendous effort is being made to promote regular PA across the lifespan, mainly through the dissemination of knowledge about the health benefits of accumulating sufficient PA.[3] The success of these campaigns is evident, as the vast majority of people are now aware of these health benefits and report the intention to be physically active. For example, in an Australian sample, ~93% of individuals declared that PA was very beneficial for their health.[4] Yet, despite an awareness of these benefits and a motivation to engage in PA, approximately half of all individuals fail to convert their laudable intentions into action.[5] This intention–action gap is observed even among individuals who are most in need of PA for their health: about two thirds of patients suffering from chronic respiratory diseases are insufficiently inactive in the 6 months following their rehabilitation program.[6]

As previously highlighted,[7] this observation challenges the effectiveness of promoting sustained PA through a sole focus on health benefits. This article aims to explain why expected health benefits are unlikely to tip the balance in favor of PA over sedentary alternatives and to shed new light on the key decision-making mechanisms underlying individuals' behavioral choices. We utilize a multidisciplinary perspective at the crossroads between decision-making sciences (economics, psychology, neurosciences), and we introduce theoretically grounded arguments to explain why highlighting health benefits is necessary but insufficient to foster a regular engagement in PA. To further support our argument, we offer a formal decision model illustrating how decision-making features jointly sway individuals' choices away from physically active options[8] (Box 1).

1. Why health benefits are insufficient for promoting PA

Decision-making is described as a succession of cognitive processes that outputs a choice between different available options on the basis of their subjective value.[9] Subjective value aggregates the expected desirability of the different options by weighting their potential benefits and costs, and choices ultimately proceed by maximizing value: individuals select the option that has been assigned the highest subjective value (i.e., higher benefits and lower costs). In the case of PA, decision-making could involve choosing between an exercise session (e.g., running outside) or a competing sedentary alternative (e.g., watching TV). This situation implies weighing the potential benefits (e.g., "I know that PA will improve my health") and costs (e.g., "but running involves so much effort") associated with the PA option against the potential benefits (e.g., "Watching my favorite TV show will probably make me laugh") and costs (e.g., "but sitting for too long may negatively impact my health in the long run") of the alternative option. We claim that, because of its low subjective value, when the only reason to be physically active relates to health benefits, it is unlikely that the PA option will be repeatedly chosen over sedentary alternatives. We support this argument by discussing available evidence in the field of PA alongside decision-making features identified as pivotal in shaping choices, including effort-discounting, delay-discounting, and beliefs distortion[a].

1.1. Effort-discounting

Refers to the decrease in the subjective value assigned to an option as the physical effort required to obtain the reward increases.[10] Effort is often perceived as a cost to avoid and, *ceteris paribus,* options requiring low (*vs.* high) physical effort are generally favored. Yet, high levels of physical effort are involved by PA—defined by essence as an increase in energy expenditure beyond its basal level at rest—and the ability of

[a] The effects of these features on the decision to engage in PA can vary depending on individual (e.g., apathy, hope) or situational factors (e.g., scarcity), but their description is beyond the scope of the current article

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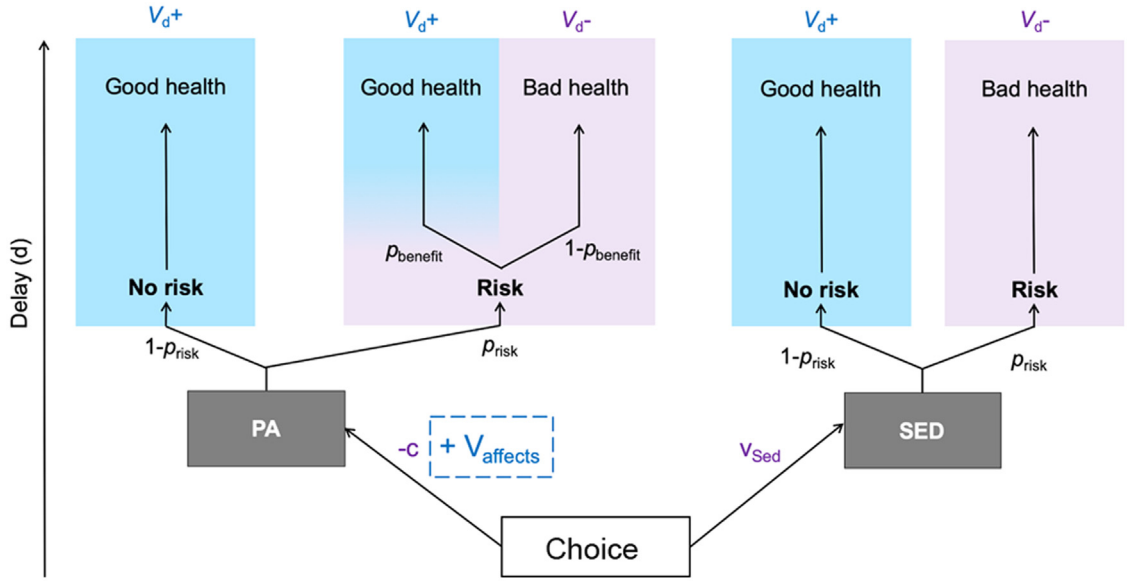

Fig. 1. Illustration of the decision model between physical activity and sedentary alternatives. PA = Physical activity; SED = sedentary alternatives. This figure highlights that when health benefits are the unique reason to action, the costs of PA and the subjective value assigned to sedentary alternatives (V_{Sed}) are the main drivers of decision-making processes. In contrast, the subjective value assigned to health benefits is likely having little effect on decision-making processes, as it is conditional to multiple parameters (i.e., value assigned to good health (V_d^+), bad health (V_d^-), risk of being in bad health (p_{risk}) and benefits of PA ($p_{benefit}$) in a delayed future (d)). However, when considering positive affects as an additional reason for action ($V_{affects}$), the balance between PA and sedentary alternatives is likely reweighted.

an individual to overcome their attraction toward effort minimization is now considered central to favoring a regular engagement in PA.[11] Since health benefits occur only when the quantity of physical effort exerted across the life course has accumulated to a certain threshold, repeatedly overcoming this attraction is necessary but may be costly. For example, someone who engages in the recommended 150 min of weekly PA from the time they are 20 to the time they are 80 years old would spend just under 1 year of their adult life engaged in PA (i.e., about 325 days, nights included). What health gains can one expect from such a tremendous level of effort? Researchers have found that, for example, being physically active increases life expectancy by 0.4 to 4.2 years on average.[12] When conceived as a cost (an aversive experience to be avoided), the physical effort invested over the course of a lifetime may appear considerable relative to expected health benefits. Since physical effort is a consubstantial characteristic of PA, the general tendency to devalue outcomes associated with effort may drastically decrease the subjective value assigned to the health benefits of PA and, consequently, hinder sustained engagement in PA.

1.2. Delay-discounting

Refers to the tendency for outcomes that are remote in time to be assigned less subjective value than more immediate rewards.[13] This delay-discounting effect accounts for the observation that individuals often prefer a smaller reward delivered soon relative to a larger reward delivered later. Moreover, the time-delayed nature of these consequences often goes hand in hand with their intangibility (i.e., rewards that are incapable of being perceived, especially of being handled, touched, or felt), with intangible options tending to be sharply devalued.[14] In light of these features, the expected health benefits of PA typically emerge on a long-term horizon: for a 20-year-old adult, engaging in PA is expected to provide positive health consequences (e.g., reduction in risk of all-cause mortality or maintenance of cognitive function) over the next 3 or 4 decades. Consistent with this reasoning, adolescents often perceive the long-term health benefits of PA as weakly motivating.[15] Although never experimentally investigated, health benefits of PA can also be seen as intangible (e.g., an improved cardiorespiratory fitness cannot be easily perceived when it comes to deciding between running or watching TV). Because long-term health benefits are only revealed in a distant future and may be perceived as intangible, the subjective value assigned to health benefits is likely lowered and insufficient to prompt a regular engagement in PA.

1.3. Beliefs distortion

Refers to mechanisms that alter the way individuals integrate available information about the current state of the world or interpret observed events.[16] These biases influence the (re-) structuration of current information and often trigger a propensity to search, interpret, and retain evidence in favor of options that are already favored. This tendency leads individuals to overestimate the likelihood of positive events (e.g., living a long and healthy life) and to underestimate the likelihood of negative ones (e.g., prematurely dying from cancer).[17] It also causes them to focus and restructure available information in a way that confirms their own pre-existing preferences and to process opposing information with a "motivated skepticism" (e.g., not trusting a pharmacological test after the test reveals a

pathological condition).[18] Later on, negative events are often attributed to external factors rather than to internal ones. For example, in a study of 16 smokers suffering from lung cancer, only two considered that their illness was directly related to smoking.[19] Following this line of reasoning, an individual may minimize the health benefits of PA if the likelihood of experiencing a negative event is perceived as weak. Furthermore, motivated skepticism may develop if PA alternatives are not valued (e.g., "I dislike running and, anyway, it will not prevent me from developing an illness"), as indirectly observed among individuals with depression who report lower expectations of health benefits resulting from PA. [20] Then, in the case of a negative event, an individual may misattribute the cause of this outcome, unlikely to pinpoint insufficient PA as the root of their chronic condition. Although yet to be the subject of thorough examination, the motivated, hard-wired and biased nature of information-related processes may undermine individuals' beliefs about the health benefits of PA. This, in turn, lowers the subjective value assigned to PA and makes perceived health benefits a relatively ineffective driver of regular engagement in PA behaviors.

When the health benefits of PA are viewed in the context of physical effort-discounting, delay-discounting, and beliefs distortion, the subjective value assigned to physically active behavioral options is weakened. This is all the more true as sedentary behaviors, like watching TV while lying down on a sofa, tempt individuals by providing effortless, immediate, and almost certain consequences. In Box 1, we elaborate a decision model of these relationships (see also Fig. 1). Specifically, decision-making processes appear to be heavily influenced by the perceived costs of engaging in PA (e.g., perceived cost of effort) and by the subjective value assigned to sedentary options. In comparison, the subjective value of health benefits has relatively little influence on decision-making processes because it appears to be conditional on—and jointly discounted by—multiple parameters (e.g., beliefs about being in a bad health or about health benefits derived from PA). Therefore, it appears unlikely that perceived health benefits are enough to foster the sustained adoption of a physically active lifestyle. Although we believe the positive health consequences of PA need to be communicated to the general public, we argue that there are additional benefits of PA that can and should be emphasized as well.

2. Why positive affective experiences can tip the balance in favor of PA

Consistent with previous research,[7] we argue that greater attention should be paid to emphasizing the positive affective experiences induced by PA. This proposition is in line with a recent movement in the behavioral sciences suggesting that a consideration of affective mechanisms is necessary for the efficient and durable modification of behaviors.[21] Paralleling this rise of affectivism in the behavioral sciences is the exponential attention now being paid to the hedonic theory in the field of PA.[22] According to this theory, humans have evolved to survive not only by satisfying their most basic needs (e.g., eating, sleeping, reproducing) but also by maximizing pleasure through the repetition of positive affective experiences within their environment.[22] Inspired by this theory and grounded upon robust empirical evidence,[23] the most recent models of PA propose that affective experiences play a pivotal role in shaping decision-making processes related to PA.[24]

Despite this increase in theoretical attention and the accumulation of empirical evidence, affective mechanisms remain elusive in most PA promotional campaigns. For example, in the 2020 guidelines from the World Health Organization, the words "affect(s)" and "pleasure" do not appear, the word "enjoyable" appears only 3 times, and potential affective experiences are far from central in the related infographics. In comparison, the word "health" is cited more than 200 times. This focus on health benefits is also reflected by the manner in which people approach PA: their motivation to engage in PA seems as likely to relate to health benefits as to the pleasure they could derive from being active[25]; and when inactive individuals exercise, they do not maximize their positive affective experiences "by default."[26] In sum, despite convincing evidence on the key role of affective mechanisms in the regulation of PA, the translation of this knowledge into effective policies and practices is still lacking. If we are serious about meeting the World Health Organization's targeted 15% reduction of physical inactivity by 2030,[2] we believe it is urgent to incorporate knowledge about affective benefits into public health efforts aimed at promoting PA. To accelerate this movement, we propose conceptual arguments in support of the fundamental role of affects in the promotion of PA below.

Positive affective experiences can impede the effects of physical effort-discounting by reducing the perceived cost of engaging in PA. Feelings of flow—the archetype of positive affective experiences—have been shown to reduce perceived physical effort.[27] Closely related to affective mechanisms, autonomous motivation (i.e., practicing PA for its own pleasure or importance) is also associated with a lower temptation to reduce effort while exercising.[28] The theory of effort minimization in physical activity (TEMPA) also suggests that positive affective experiences toward PA could help individuals overcome their innate attraction toward effort minimization by reducing the perceived effort associated with physically active behaviors.[11]

Regarding delay-discounting, positive affective experiences represent immediate consequences, which can be triggered during and/or directly after PA. Once engaged in PA, multiple sensory signals (e.g., interoceptive and cognitive pathways) are integrated to shape affective experiences.[29] Affective experiences become immediately available for interpretation (e.g., "Am I experiencing pleasure right now?") and, thus, are tangible, for better or sometimes worse. On a slightly larger timeframe, being physically active has acute beneficial effects on mood, perceived energy, or stress.[30] Burgeoning evidence suggests that the positive consequences mentioned above may depend upon affective experiences during PA. Individuals who report more positive affects while exercising may in fact obtain greater benefits afterwards (e.g., increased feelings of well-being).[31]

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Finally, positive affective experiences have the potential to strengthen beliefs about the benefits of engaging in regular PA. Mechanisms involved in beliefs distortion can be described as a double-edge sword: they could either impede or favor the integration of information about the benefits of PA depending on whether individuals have developed negative or positive affective experiences. If PA is only perceived as something unpleasant, individuals may disregard its potential benefits; but if PA is enjoyable, individuals may be more likely to perceive its health benefits. Indirect evidence provides support for this idea by showing that health-related and affects-related expectations toward PA partly overlap.[32] In other words, as positive affective experiences become increasingly evident to the individual, the health benefits of PA may also seem more credible. Still, they represent background motivation rather than the primary driver of choices.

By reducing the perception of effort, highlighting immediate consequences, and strengthening beliefs about health benefits, positive affective experiences have the potential to increase the subjective value assigned to PA and to energize individuals' engagement in a lifelong active lifestyle. In Box 1, we demonstrate why adding positive affects to the equation is needed to sway decision-making processes toward PA rather than toward sedentary alternatives[b]. To further support our conceptual propositions, future research should look for direct evidence of the relationships between affective mechanisms and decision-making features.

3. Promoting positive affective experiences toward PA

We argue that the promotion of PA should focus on positive affective experiences (see an illustration of a PA promotional campaign among British children with disability[33]). Far from the mantra "no pain, no gain," motivational messages could remind that positive affective experiences can be obtained with relatively low levels of effort, as exemplified by the World Health Organization slogan "Every move counts."[2] Highlighting that positive affective experiences may reduce the perception of effort seems critical for getting past the effects of effort-discounting. To weaken the effects of delay-discounting and belief distortion biases, messages could be reframed to feature short-term positive affective consequences that can be directly felt (e.g., pleasure) and are less likely to be distorted by individuals (e.g., reduced stress, higher perceived energy). In lay terms, our message is that people should run after the positive affective experiences of PA and that, secondarily, they may expect to obtain health benefits. Not the opposite.

Although important, if they are not accompanied by an effort to ensure individuals develop positive affective experiences, these changes to the promotion of PA will amount to nothing. Regarding the heterogeneity in affects triggered by PA (e.g., from displeasure to pleasure),[34] improving affective experiences toward PA among the widest possible population—and especially the most physically inactive ones—may look like wishful thinking. The fact that affective experiences are partly under the control of the individual gives us some reason to hope. Affective experiences can be manipulated in multiple ways, including by changing external and internal parameters of PA.[35] Regarding external parameters, encouraging the practice of PA in pleasant environments (e.g., outdoors, with music) can foster positive affective experiences. Regarding internal parameters, opting for self-selected intensity or manipulating the structure of the session (e.g., ending the session with a lower intensity) can promote positive affective experiences toward PA.

In light of the need to educate people on how to maximize pleasure while exercising, we suggest that motivational messages should not only remind individuals to search for positive affects while being physically active,[26] but also provide practical advices for increasing the odds of experiencing such affects. For example, ending a running session with a low-intensity period may encourage individuals to proactively engage in the search for positive affective experiences while exercising. Beyond motivational messages, practitioners (e.g., physical education teachers, health and PA professionals) are uniquely situated to nurture environments that effectively promote positive affective experiences toward PA. These professionals would greatly benefit from a more in-depth education on maximizing positive affective experiences for individuals under their care. A growing literature is investigating the effectiveness of multiple interventional levers and will undoubtedly provide innovative perspectives for fostering these positive affective experiences.

4. Conclusion

From Morris' pioneering study into the effects of physical inactivity on the health of London bus drivers to best-sellers such as *Jogging* by Bill Bowerman or *Aerobics* by Kenneth Cooper, evidence on the beneficial effects of PA has been accumulating, and has been disseminated to the general public, since the middle of the 20th century. It turns out that an exclusive focus on health benefits is insufficient to address the ever-growing pandemic of physical inactivity. Leveraging a multidisciplinary decision-making framework, we formally demonstrated how expected health benefits are jointly discounted by multiple mechanisms, making their subjective value insufficient for favoring sustained engagement in PA. In contrast, affective mechanisms may have the potential to tip the balance in favor of PA over sedentary alternatives. From this perspective, a change in the framing of the promotion of PA is urgently needed: affective experiences should be at the core of all campaigns to promote PA, as well as central to an individual's own relationship with PA. We hope that our suggestions will expand the efforts of researchers and practitioners to put forth the key role of positive affective experiences in motivating sustained PA.

[b] Although our reasoning focuses on affects, any other immediate and concomitant potential outcomes of PA (e.g., feelings of accomplishment, self-relevance for identity, social connections) that are more or less strongly related to affective experiences may also increase the subjective value assigned to PA alternatives

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Authors' contributions

SM, ML, and BC conceived the study and drafted the manuscript. All authors contributed to the improvement of the manuscript and approved its final version. All authors have read and approved the final version of the manuscript, and agree with the order of presentation of the authors.

Declaration of Competing Interest

The authors declare that they have no competing interests.

References

1. Pontzer H. Ecological energetics in early homo. *Curr Anthropol* 2012;**53** (Suppl. 6):S346–58. doi:10.1086/667402.
2. Bull FC, Al-Ansari SS, Biddle S, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med* 2020;**54**:1451–62.
3. Bauman A, Chau J. The role of media in promoting physical activity. *J Phys Act Health* 2009;**6**(Suppl. 2):S196–210.
4. Fredriksson SV, Alley SJ, Rebar AL, Hayman M, Vandelanotte C, Schoeppe S. How are different levels of knowledge about physical activity associated with physical activity behaviour in Australian adults? *PLoS One* 2018;**13**: e0207003. doi:10.1371/journal.pone.0207003.
5. Rhodes RE, de Bruijn G-J. How big is the physical activity intention-behaviour gap? a meta-analysis using the action control framework. *Br J Health Psychol* 2013;**18**:296–309.
6. Saunders TJ, Dechman G, Hernandez P, et al. Distinct trajectories of physical activity among patients with COPD during and after pulmonary rehabilitation. *COPD* 2015;**12**:539–45.
7. Ekkekakis P. People have feelings! Exercise psychology in paradigmatic transition. *Curr Opin Psychol* 2017;**16**:84–8.
8. Fox CR, Poldrack RA. Prospect theory and the brain. In: Glimcher PW, Camerer CF, Fehr E, Poldrack RA, editors. *Neuroeconomics*. Cambridge, MA: Elsevier Academic Press; 2009.p.145–73.
9. Rangel A, Camerer C, Montague PR. A framework for studying the neurobiology of value-based decision making. *Nat Rev Neurosci* 2008;**9**:545–56.
10. Prévost C, Pessiglione M, Météreau E, Cléry-Melin M-L, Dreher J-C. Separate valuation subsystems for delay and effort decision costs. *J Neurosci* 2010;**30**:14080–90.
11. Cheval B, Boisgontier MP. The theory of effort minimization in physical activity. *Exerc Sport Sci Rev* 2021;**49**:168–78.
12. Reimers CD, Knapp G, Reimers AK. Does physical activity increase life expectancy? A review of the literature. *J Aging Res* 2012;**2012**: 243958. doi:10.1155/2012/243958.
13. Ainslie G. Specious reward: A behavioral theory of impulsiveness and impulse control. *Psychol Bull* 1975;**82**:463–96.
14. Rick S, Loewenstein G. Intangibility in intertemporal choice. *Philos Trans R Soc B Biol Sci* 2008;**363**:3813–24.
15. Strömmer S, Shaw S, Jenner S, et al. How do we harness adolescent values in designing health behaviour change interventions? A qualitative study. *Br J Health Psychol* 2021;**26**:1176–93.
16. Sharot T, Kanai R, Marston D, Korn CW, Rees G, Dolan RJ. Selectively altering belief formation in the human brain. *Proc Natl Acad Sci U S A* 2012;**109**:17058–62.
17. Weinstein ND. Unrealistic optimism about future life events. *J Pers Soc Psychol* 1980;**39**:806–20.
18. Ditto PH, Lopez DF. Motivated skepticism: Use of differential decision criteria for preferred and nonpreferred conclusions. *J Pers Soc Psychol* 1992;**63**:568–84.
19. Salander P. Attributions of lung cancer: My own illness is hardly caused by smoking. *Psychooncology* 2007;**16**:587–92.
20. Pomp S, Fleig L, Schwarzer R, Lippke S. Depressive symptoms interfere with post-rehabilitation exercise: Outcome expectancies and experience as mediators. *Psychol Health Med* 2012;**17**:698–708.
21. Dukes D, Abrams K, Adolphs R, et al. The rise of affectivism. *Nat Hum Behav* 2021;**5**:816–20.
22. Cabanac M, Bonniot-Cabanac M-C. Decision making: Rational or hedonic? *Behav Brain Funct* 2007;**3**:45. doi:10.1186/1744-9081-3-45.
23. Rhodes RE, Kates A. Can the affective response to exercise predict future motives and physical activity behavior? A systematic review of published evidence. *Ann Behav Med* 2015;**49**:715–31.
24. Rhodes RE, McEwan D, Rebar AL. Theories of physical activity behaviour change: A history and synthesis of approaches. *Psychol Sport Exerc* 2019;**42**:100–9.
25. Molanorouzi K, Khoo S, Morris T. Motives for adult participation in physical activity: Type of activity, age, and gender. *BMC Public Health* 2015;**15**:66. doi:10.1186/s12889-015-1429-7.
26. Zenko Z, Kahn RM, Berman CJ, Hutchinson JC, Jones L. Do exercisers maximize their pleasure by default, Using prompts to enhance the affective experience of exercise. *Sport Exerc Perform Psychol* 2020;**9**:405–17.
27. Swann C, Jackman PC, Schweickle MJ, Vella SA. Optimal experiences in exercise: A qualitative investigation of flow and clutch states. *Psychol Sport Exerc* 2019;**40**:87–98.
28. Taylor IM, Smith K, Hunte R. Motivational processes during physical endurance tasks. *Scand J Med Sci Sports* 2020;**30**:1769–76.
29. Ekkekakis P. The dual-mode theory of affective responses to exercise in metatheoretical context: II. Bodiless heads, ethereal cognitive schemata, and other improbable dualistic creatures, exercising. *Int Rev Sport Exerc Psychol* 2009;**2**:139–60.
30. Ensari I, Greenlee TA, Motl RW, Petruzzello SJ. Meta-analysis of acute exercise effects on state anxiety: An update of randomized controlled trials over the past 25 years. *Depress Anxiety* 2015;**32**:624–34.
31. White RL, Parker PD, Lubans DR, et al. Domain-specific physical activity and affective wellbeing among adolescents: An observational study of the moderating roles of autonomous and controlled motivation. *Int J Behav Nutr Phys Act* 2018;**15**:87.
32. Gellert P, Ziegelmann JP, Schwarzer R. Affective and health-related outcome expectancies for physical activity in older adults. *Psychol Health* 2012;**27**:816–28.
33. Smith B, Netherway J, Jachyra P, et al. Infographic. communicate physical activity guidelines for disabled children and disabled young people. *Br J Sports Med* 2022;**56**:588–9.
34. Ekkekakis P, Parfitt G, Petruzzello SJ. The pleasure and displeasure people feel when they exercise at different intensities: Decennial update and progress towards a tripartite rationale for exercise intensity prescription. *Sport Med* 2011;**41**:641–71.
35. Jones L, Zenko Z. Strategies to facilitate more pleasant exercise experiences. In: Zenko Z, Jones L, editors. *Essentials of exercise and sport psychology: An open access textbook*. Malmo, Sweden: Society for Transparency, Openness, and Replication in Kinesiology; 2021.p.242–70. doi:10.51224/B1011.

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