



The Perils of Adaptation: Inactivity, Laziness, and the Decline of Physical Well-being

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Abstract

This pervasive ability to adapt, while historically crucial for survival, now presents a paradoxical challenge, particularly as technological advancements have inadvertently fostered increasingly sedentary lifestyles ([Woessner et al., 2021](#)). This shift, driven by innovations that reduce physical exertion in daily tasks and leisure, has profoundly impacted human health and well-being ([Altan, 2023](#)) ([Woessner et al., 2021](#)) ([Hanna et al., 2023](#)). This pervasive sedentary behavior, exacerbated by the convenience of modern technology, has led to a significant decline in physical activity levels across global populations ([Hanna et al., 2023](#)). This decline has far-reaching consequences, contributing to a myriad of chronic diseases and diminishing overall health ([Kapoor et al., 2022](#)) ([Grzelak, 2024](#)). The simplification of labor through mechanization and technological progress, while enhancing efficiency, has simultaneously ushered in a global health concern in the form of sedentarism, characterized by habitual low-energy expenditure activities ([Goyal & Rakhra, 2024](#)) ([Woessner et al., 2021](#)). This modern predicament contrasts sharply with our evolutionary heritage, where physical exertion was an inherent part of daily survival, leading to a disconnect between our biological predispositions



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and contemporary lifestyle demands ([Booth et al., 2017](#)). This discrepancy highlights how readily humans adapt to comfort, even if detrimental to long-term health, illustrating the double-edged nature of our adaptive capacity ([Kumareswaran, 2023](#)) ([Grzelak, 2024](#)). This inherent adaptability, coupled with the "technophilic" societal shift towards physical comfort, has cultivated environments that actively limit physical activity and promote prolonged sitting ([Goyal & Rakhra, 2024](#)) ([Owen et al., 2010](#)).

Keywords: *The Perils of Adaptation, Inactivity, Laziness, the Decline of Physical Well-being, Well-being*

Introduction

This evolutionary inclination towards energy conservation, once beneficial for survival in resource-scarce environments, now manifests as a predisposition to inactivity in an age of abundance ([Booth et al., 2017](#)). This predisposition, while seemingly a neutral trait, becomes a significant health detriment in an environment where physical activity is no longer a necessity for daily function, contributing to a substantial public health burden ([Choi, 2005](#)) ([Nouailhetas, 2017](#)). This global shift towards an "inactive phenotype" is a major contributor to the worldwide pandemic of non-communicable diseases, creating significant health and economic costs for societies across all income levels ([Jayasinghe et al., 2020](#)). This pervasive issue is further compounded by the epidemiological transition, where populations that have undergone nutritional and physical activity transitions become particularly susceptible to physically inactive and sedentary behaviors ([Bourdier et al., 2022](#)) ([Jayasinghe et al., 2020](#)). This is evident in the drastic and rapid changes in physical activity and sedentary behavior observed across all domains of daily life over the past century ([Bourdier et al., 2022](#)). This shift encompasses a reduction in occupational, transport, leisure-time, and household physical activities, largely supplanted by automated processes and screen-based entertainment ([Goyal & Rakhra, 2024](#)). The internet's ubiquitous accessibility on mobile devices has further exacerbated this trend, directly correlating with increased sedentary behavior and obesity in both children and adults ([Woessner et al., 2021](#)). This global phenomenon suggests that while our capacity for adaptation allowed survival in diverse harsh environments, it now



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paradoxically facilitates a comfortable, yet detrimental, disengagement from the physical demands that once shaped our physiological and psychological robustness. This modern environment, therefore, subtly encourages a basal metabolic state that prioritizes energy conservation, an evolutionary remnant that now underpins the pervasive issue of physical inactivity ([Booth et al., 2017](#)). Furthermore, the escalating prevalence of sedentary behaviors is intricately linked to societal and behavioral changes driven by industrial, technological, and digital advancements since the Industrial Revolution and the Great Acceleration ([Bourdier et al., 2022](#)). This has led to a significant increase in the amount of time individuals spend sitting, a factor now recognized as an independent risk for numerous adverse health outcomes ([Owen et al., 2020](#)) ([Henson et al., 2023](#)). Indeed, the global health burden attributed to physical inactivity is substantial, contributing to an estimated 6–10% of chronic non-communicable diseases and 9% of premature deaths globally ([Jayasinghe et al., 2020](#)). The economic impact of this widespread inactivity is equally profound, with global healthcare systems incurring an estimated \$53.8 billion in costs attributed to physical inactivity in 2013 alone ([Katzmarzyk, 2022](#); [Katzmarzyk et al., 2021](#)).

This financial burden underscores the urgent need for interventions to counteract the rising tide of sedentarism, particularly given the strong correlation between low physical activity and the development of chronic diseases like type 2 diabetes, coronary artery disease, and certain cancers ([Hernández-Álvarez et al., 2023](#)). The insidious nature of physical inactivity also plays an independent role in accelerating the loss of cardiovascular and strength fitness, thereby shortening healthspan and lowering the age of onset for chronic diseases ([Booth et al., 2017](#)). This highlights how sedentarism is now recognized as a major risk factor for the rising incidence of non-communicable diseases, especially among young adults and adults ([Goyal & Rakhra, 2024](#)). This sedentary lifestyle, even in individuals who meet recommended physical activity guidelines, can significantly increase the risk of all-cause mortality, emphasizing the critical distinction between being physically active and avoiding prolonged periods of sitting ([Henson et al., 2023](#)) ([Goyal & Rakhra, 2024](#)). This distinction underscores the importance of addressing both the quantity of physical activity and the duration of sedentary behavior to mitigate health risks ([Henson et al., 2023](#)) ([Goyal & Rakhra, 2024](#)). Despite its widely recognized negative health impacts, approximately 23% of adults aged 18 and over are insufficiently physically active, a figure that continues to rise in many countries and



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significantly contributes to global mortality ([Gao & Lee, 2022](#)). Such inactivity is projected to intensify, with a potential increase in sedentary time over the next decade, necessitating comprehensive and effective interventions to counteract this global trend ([Bonnet & Barela, 2021](#)). The economic costs associated with physical inactivity are staggering, causing approximately \$13.7 billion in global productivity losses and contributing between 0.3% and 4.6% of total national healthcare expenditures ([Xu et al., 2022](#)).

This substantial financial burden underscores the critical need for targeted public health strategies and policy interventions aimed at mitigating the prevalence of physical inactivity and its associated morbidity and mortality ([Santos et al., 2022](#)). These costs include direct public healthcare expenditures for non-communicable diseases and mental health conditions directly attributable to insufficient physical activity, such as coronary heart disease, stroke, type 2 diabetes, hypertension, cancer, dementia, and depression ([Santos et al., 2022](#)). These conditions collectively represent a substantial drain on healthcare resources, with physical inactivity being a modifiable risk factor for nearly 85% of premature deaths from non-communicable diseases in low- and middle-income countries ([Santos et al., 2022](#)). This persistent global challenge highlights the urgent need for robust policy interventions and greater investment in strategies that promote increased physical activity to alleviate the significant public health and economic burdens ([Santos et al., 2022](#)) ([Arena et al., 2017](#)). The COVID-19 pandemic further exacerbated these issues, leading to a substantial decrease in physical activity levels and a dramatic increase in sedentary behaviors globally, particularly affecting disadvantaged populations ([Ploeg & Bull, 2020](#)) ([Wongsingha et al., 2023](#)). Moreover, physical inactivity is a significant modifiable risk factor for various non-communicable diseases, including coronary heart disease, type 2 diabetes, and certain cancers, which places a substantial economic burden on public health systems ([García, 2022](#)). Indeed, projections indicate that nearly 500 million new cases of preventable major non-communicable diseases will emerge globally by 2030 if current physical inactivity trends persist, resulting in direct healthcare expenditures of approximately INT\$520 billion ([Santos et al., 2022](#)). This projected cost underscores the critical imperative for policy makers to prioritize strategic investments in public health initiatives aimed at promoting physical activity and mitigating the long-term economic and societal consequences of a sedentary lifestyle ([Santos et al., 2022](#)). Consequently, understanding the psychological underpinnings of adaptive behaviors, particularly those



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leading to inactivity, is paramount for developing effective interventions. This understanding can inform targeted strategies to disrupt maladaptive patterns and foster healthier habits, especially when considering the complex interplay between psychological inertia and environmental cues.

Methodology

The estimated global annual cost of inaction on physical inactivity is projected to reach approximately \$47.6 billion, highlighting the urgent need for proactive health policies ([Santos et al., 2022](#)). While the majority of these new cases of non-communicable diseases (74%) are expected in low- and middle-income countries, high-income nations are anticipated to bear a disproportionately larger share of the economic costs ([Santos et al., 2022](#)). For instance, although dementia accounts for a mere 3% of these preventable non-communicable diseases, its treatment and management are projected to consume 22% of all associated costs ([Santos et al., 2022](#)) ([Santos et al., 2022](#)). Similarly, type 2 diabetes and various cancers, despite accounting for only 2% and 1% of preventable cases, respectively, are projected to incur 9% and 15% of all costs, emphasizing the disproportionate financial burden of these conditions ([Santos et al., 2022](#)). Therefore, understanding the multifaceted impact of physical inactivity is crucial for developing targeted interventions that address both the physiological and psychological barriers to a more active lifestyle, ultimately fostering greater public health and reducing healthcare expenditures. Such interventions must integrate behavioral science with public health strategies to promote sustained engagement in physical activity across diverse populations. This comprehensive approach is essential for cultivating a societal shift towards greater activity, acknowledging that individual motivations are often intertwined with broader environmental and social determinants. The cost of inaction on physical inactivity globally is projected to reach approximately \$47.6 billion annually, further underscoring the pressing need for comprehensive health policies ([Santos et al., 2022](#)). Furthermore, the total direct public healthcare costs attributable to physical inactivity, encompassing diseases such as coronary heart disease, stroke, type 2 diabetes, cancer, and depression, are estimated to be substantial, emphasizing the profound economic implications of sedentary lifestyles ([Santos et al., 2022](#)). These projections underscore the urgent need for a paradigm shift in public health strategies,



moving beyond awareness campaigns to implement robust, policy-driven interventions that facilitate and incentivize physical activity across all demographics ([Santos et al., 2022](#)).

Literature Review

Such proactive measures are vital for preventing the escalation of non-communicable diseases, which currently account for a substantial portion of global mortality and disability-adjusted life years ([Liu et al., 2022](#)). The increasing prevalence of physical inactivity is directly linked to an expanding array of chronic diseases and conditions, contributing to a significant public health burden ([Katzmarzyk et al., 2023](#)). For instance, in the United States, less than 50% of the population adheres to recommended aerobic physical activity guidelines, contributing to over \$117 billion in annual healthcare expenditures ([Ching et al., 2024](#)) ([Zhang et al., 2025](#)). This substantial economic impact highlights the critical need for multifaceted interventions that address both individual behaviors and systemic barriers to physical activity ([Santos et al., 2022](#)) ([Ding et al., 2017](#)). This global epidemic of physical inactivity accounts for an estimated 5.3 million deaths annually worldwide and contributes significantly to conditions like cardiovascular diseases, certain cancers, and diabetes ([Sallis et al., 2020](#)). Furthermore, the global burden of physical inactivity and sedentary behavior is responsible for 1.6 million deaths annually attributed to non-communicable diseases, posing a significant challenge to achieving sustainable development goals ([Kirat et al., 2024](#)). The financial repercussions are equally staggering, with the estimated global cost of insufficient physical activity to healthcare systems reaching approximately \$53.8 billion ([Pogrmilović et al., 2018](#)) ([Hanscombe et al., 2020](#)). Of this, 68% is borne by the public sector, emphasizing the immense financial strain on national healthcare budgets ([Pogrmilović et al., 2020](#)). These escalating costs and health consequences necessitate a deeper understanding of the psychological mechanisms that underpin sedentary behavior and hinder efforts to promote physical activity ([Lee et al., 2012](#)). This economic burden is further exacerbated by the direct healthcare costs associated with sedentary behavior, which are substantial in developed nations like the UK and Canada, underscoring the broader societal implications of prolonged inactivity ([Heron et al., 2019](#)) ([Chaput et al., 2023](#)). This complex interplay of health and economic factors positions physical inactivity as a critical area for targeted intervention, necessitating a nuanced approach that considers both individual



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motivational barriers and broader socio-economic determinants ([Hafner et al., 2020](#)). This necessitates a comprehensive analysis of the psychological underpinnings of habit formation and the challenges associated with initiating and maintaining physically active lifestyles. This is particularly pertinent given that, despite abundant evidence for health benefits, fewer than half of US adults meet minimal aerobic activity guidelines, and nearly one-third are physically inactive ([Carlson et al., 2014](#)). This widespread inertia underscores a significant public health crisis, impacting individual well-being and imposing substantial economic burdens on healthcare systems globally ([Duregon et al., 2022](#)).

Despite this growing awareness, physical inactivity levels in high-income Western countries have continued to rise, with only 54% of individuals who intend to be active actually achieving their goals, further emphasizing the need for effective behavioral change interventions ([As et al., 2021](#)). This phenomenon is further complicated by the fact that many individuals spend an average of 8–11 hours per day sitting, highlighting the pervasive nature of sedentary behavior in contemporary society ([Broeke et al., 2022](#)). This alarming trend in sedentary lifestyles is a major contributor to the global burden of non-communicable diseases, with physical inactivity recognized as the fourth leading risk factor for worldwide mortality ([Giurgiu et al., 2024](#)) ([Gagnon et al., 2018](#)). This escalating public health crisis necessitates a thorough examination of the psychological and environmental factors contributing to widespread sedentary behavior, particularly in the context of seasonal changes and their impact on motivation. The psychological aspects of human adaptation, particularly concerning shifts in environmental conditions and their influence on physical activity, warrant closer investigation to develop effective interventions ([Falck et al., 2023](#)). This comprehensive analysis must integrate behavioral economics and social psychology principles to design strategies that foster sustained physical activity, moving beyond mere awareness to cultivate ingrained habits ([Lachman et al., 2018](#)).

Psychological states such as "amotivation" (a lack of intention or desire to exercise) are frequently cited as key barriers to physical activity, alongside perceived time constraints, making it crucial to explore these intrinsic factors ([Rodrigues et al., 2018](#)). This is particularly relevant as sedentary behavior itself is estimated to cost the UK's National Health Service £0.7 billion annually in direct healthcare costs, prompting many European nations to integrate



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recommendations for reducing and breaking up sitting time into their physical activity guidelines ([Blackburn et al., 2020](#)). These guidelines often emphasize the importance of habit formation, as a substantive proportion of people's daily actions are accounted for by habits ([Hagger, 2018](#)). However, despite widespread knowledge of the health benefits of regular physical activity, only a small percentage of adults, specifically 9.5% of men and 7% of women, meet recommended guidelines when activity is objectively measured, highlighting a significant gap between awareness and adherence ([Blevins et al., 2017](#)).

This disparity is often attributed to the immediate costs associated with physical activity, such as effort and time, versus the delayed and less tangible benefits, which can undermine intrinsic motivation and consistent engagement ([Haag et al., 2024](#)). Indeed, a significant portion of the global population, estimated at 28% of adults, fails to meet the recommended minimum physical activity levels, contributing to approximately 2 million deaths annually directly attributable to low physical activity ([Carthy et al., 2021](#)) ([Timm et al., 2023](#)). Furthermore, emerging evidence indicates that global adult physical inactivity has increased from 2000 to 2022, underscoring a persistent challenge in public health promotion ([Sheng et al., 2025](#)). Such pervasive inactivity is associated with increased risks of non-communicable diseases, including cardiovascular diseases and type 2 diabetes, underscoring the urgent need for effective behavioral change interventions ([Wang et al., 2024](#)). frequently feeling ineffectual in their attempts to establish and maintain regular exercise routines. This challenge is compounded by the fact that even individuals who regularly engage in healthy eating and physical activity can experience lapses in motivation, particularly during seasonal transitions that impact environmental cues and social visibility ([Ferguson et al., 2021](#)). This reduction in extrinsic motivators, such as the desire for an "enviable image," can significantly diminish adherence to physical activity guidelines during colder months, even for those with established routines ([Raghavan et al., 2023](#)). This highlights the critical role of intrinsic motivation and robust habit formation in sustaining physical activity, especially when external visual reinforcement is diminished or absent ([Hawladar et al., 2022](#)). Therefore, understanding the mechanisms by which visual stimuli influence motivation for physical activity is crucial for designing effective, season-agnostic interventions that foster long-term adherence ([Ominyi et al., 2024](#)). This is especially pertinent given that consistent engagement in physical activity is linked to higher



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self-efficacy and social support, factors that can be particularly challenged by environmental shifts ([Gjestvang et al., 2021](#)).

The psychological impact of reduced visual reinforcement on exercise adherence during colder months warrants further investigation, as it may elucidate novel strategies for promoting sustained physical activity regardless of seasonal variations. This gap between knowledge and action points to the intricate interplay of psychological, social, and environmental factors that shape health behaviors, especially concerning physical activity. Inactivity is considered a harmful risk factor for numerous chronic conditions, and despite various intervention strategies, not all achieve desired outcomes ([Schwartz et al., 2019](#)). This suggests a critical need to explore the underlying behavioral and psychological antecedents that drive long-term physical activity engagement, particularly for interventions targeting both initiation and sustained participation ([Rhodes, 2021](#)).

This underscores the necessity for comprehensive, multi-faceted approaches that address the key barriers in inactive populations, such as psychological factors, environmental obstacles, time constraints, and social limitations ([Zanaboni et al., 2022](#)). Among these, psychological barriers, particularly a perceived lack of motivation, are frequently cited by younger adults as significant obstacles to engaging in physical activity, even more so than practical physical constraints ([Artistico et al., 2013](#)). This suggests that interventions solely focused on practical accessibility or physical limitations may be insufficient, necessitating a deeper exploration into the transient and multifaceted nature of motivation itself ([Stults-Kolehmainen et al., 2023](#)) ([Nascimento et al., 2023](#)). Therefore, successful interventions must transcend mere practical considerations and instead cultivate intrinsic motivation and self-efficacy to ensure sustained engagement in physical activity, especially given diverse and unique individual training goals ([Rogowska & Morouço, 2024](#)) ([Zanaboni et al., 2022](#)). This necessitates a shift towards personalized approaches that not only consider objective health outcomes but also acknowledge subjective motivators and perceived barriers to physical activity ([Garcia et al., 2022](#)). Such approaches should also consider the dynamic relationship between self-efficacy and motivation, as heightened self-efficacy can positively reinforce motivational levels, creating a feedback loop conducive to sustained engagement ([Tao et al., 2024](#)).



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Conversely, lower self-efficacy may lead to decreased motivation, thereby perpetuating inactivity despite an individual's knowledge of the health benefits of exercise ([Tao et al., 2024](#)). This intention-behavior gap, wherein knowledge of health benefits fails to translate into consistent action, is a significant challenge in public health, often exacerbated by the complexities of self-regulatory processes ([Englert et al., 2023](#)) ([Hansen et al., 2023](#)). Indeed, effective interventions require a comprehensive understanding of how capability, opportunity, and motivation interact to facilitate behavior change, as individual psychological factors like self-efficacy significantly influence the adoption and maintenance of physical activity ([Snuggs et al., 2023](#)) ([Zanaboni et al., 2022](#)). For instance, interventions that provide clear exercise instructions and opportunities for experiential learning can significantly increase participation, especially when coupled with strategies for managing time to ensure sufficient leisure for physical activity ([Liangruenrom et al., 2019](#)). Conversely, perceived barriers such as lack of time, fatigue, and aversion to physical exertion frequently hinder participation in leisure-time physical activity among young women ([Fernández-Lasa et al., 2024](#)). This underscores the need for gender-sensitive policy approaches that address both volitional and contextual mechanisms undermining physical activity engagement in this demographic ([Luque-Casado et al., 2021](#)). Furthermore, while individual motivation is crucial, broader systemic factors, such as infrastructure and urban design, also significantly influence the opportunity for physical activity and, consequently, its consistent adoption ([Willmott et al., 2021](#)). Recognizing these multifaceted influences, recent research has increasingly focused on the critical role of self-efficacy as a determinant of healthy lifestyle promotion and sustained physical activity ([Lee et al., 2020](#)) ([Tao et al., 2024](#)). Higher levels of self-efficacy are linked to greater motivation and confidence in one's ability to overcome barriers to exercise and adhere to exercise regimens, underscoring its pivotal role in promoting physical activity ([Tao et al., 2024](#)). Specifically, individuals with elevated self-efficacy tend to formulate more concrete action plans and coping strategies, thereby facilitating the transition from intention to actual exercise behavior ([Hou et al., 2022](#)). This psychological construct not only directly influences participation in physical activities but also indirectly shapes outcome expectations and perceptions of potential obstacles ([Middelweerd et al., 2018](#)).

Consequently, fostering self-efficacy through targeted interventions can enhance adherence by empowering individuals to set achievable goals, self-regulate their efforts, and effectively



manage anticipated challenges ([Yuan et al., 2025](#)). Moreover, self-efficacy is a dynamic construct, influenced by past performance accomplishments, vicarious experiences, verbal persuasion, and physiological and affective states, all of which contribute to an individual's belief in their capability to engage in physical activity ([Kwiecień-Jaguś et al., 2021](#)). This multifaceted nature suggests that interventions aimed at improving physical activity adherence should integrate strategies that target these various sources of self-efficacy to maximize their effectiveness ([Yuan et al., 2025](#)) ([Dishman et al., 2005](#)). For instance, studies show that exercise self-efficacy consistently predicts physical activity engagement, highlighting its importance for promoting sustained involvement in healthy behaviors ([Garn & Simonton, 2020](#)) ([Tao et al., 2024](#)). This relationship is consistently observed across different age groups and populations, indicating its universal applicability as a predictor of physical activity ([McAuley et al., 2011](#)). Therefore, understanding and actively cultivating self-efficacy is paramount for researchers and practitioners aiming to develop effective strategies for promoting long-term physical activity and combating sedentary lifestyles ([Baghbani et al., 2023](#)) ([Yu et al., 2024](#)) ([Myers et al., 2019](#)). Furthermore, individuals with higher self-efficacy are more likely to view challenging tasks as opportunities for mastery and set ambitious goals, demonstrating greater commitment to those goals ([Pekmezi et al., 2009](#)). This enhanced self-belief contributes to increased perseverance in the face of obstacles, ultimately leading to greater success in achieving exercise and health-related objectives ([Yuan et al., 2025](#)) ([Guo et al., 2024](#)). Indeed, exercise training interventions have been shown to significantly impact perceived self-efficacy among adult populations, thereby reinforcing its central role in health behavior ([Baghbani et al., 2023](#)). This robust predictive power of self-efficacy on exercise behavior underscores its significance as a key psychological determinant in health promotion ([Li & Mu, 2021](#)).

Findings

Specifically, past performance accomplishments, vicarious experiences, verbal persuasion, and physiological states all contribute to the formation of self-efficacy beliefs, which in turn influence an individual's thought patterns and behaviors regarding physical activity ([Myers et al., 2019](#)) ([Warner et al., 2011](#)). These distinct sources of self-efficacy interact in complex



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ways, with mastery experiences generally considered the most potent influence on an individual's confidence in their capabilities ([Yang et al., 2023](#)). Conversely, a lack of perceived competence or repeated failures can diminish self-efficacy, leading to avoidance of physical activities and exacerbating sedentary behaviors ([Warner et al., 2014](#)). This intricate interplay between self-efficacy and behavioral outcomes highlights the importance of tailored interventions that bolster an individual's belief in their capacity to engage in and maintain physical activity ([Galarraga et al., 2020](#)). However, while exercise generally improves self-efficacy, this effect is not universally observed across all measures of self-efficacy, necessitating a nuanced approach to intervention design ([Baghbani et al., 2023](#)). This complexity mandates that interventions address not only general self-efficacy but also task-specific self-efficacy to ensure congruence between an individual's belief in their ability and the specific demands of physical activity ([Blom et al., 2021](#)). Moreover, high self-efficacy is consistently associated with increased self-confidence and greater adherence to behavioral expectations, especially when confronting challenges ([Yu et al., 2024](#)). This intrinsic belief in one's capabilities acts as a crucial mediator, allowing individuals to effectively navigate and overcome obstacles that might otherwise deter sustained engagement in physical activity ([Mu et al., 2024](#)) ([Peng et al., 2025](#)).

Argument

This suggests that interventions focused on enhancing self-efficacy through strategies such as action planning and instruction are more likely to yield significant improvements in both self-efficacy and physical activity levels ([Williams & French, 2011](#)). This is further supported by the understanding that a high degree of concordance between domain-specific self-efficacy beliefs and proposed outcomes is necessary for valid testing of self-efficacy theory ([Myers et al., 2019](#)). This alignment ensures that the theoretical constructs accurately reflect the practical application of self-efficacy in promoting and maintaining healthy behaviors, particularly within the context of physical activity ([Ibeneme et al., 2024](#)). Such congruence between perceived capabilities and desired outcomes is essential for translating self-efficacy into actual behavioral change ([Holler et al., 2019](#)). This framework posits that individuals who believe in their



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capacity to succeed at a task are more likely to undertake it and persist despite challenges ([Latino et al., 2021](#)).

This inherent belief system directly impacts motivation, as individuals with higher self-efficacy often exhibit greater intrinsic motivation arising from a genuine interest in physical activity ([Tao et al., 2024](#)). Conversely, lower self-efficacy can lead to decreased motivation, creating a negative feedback loop that perpetuates inactivity and sedentary lifestyles ([Tao et al., 2024](#)). Therefore, interventions must address both the cognitive and motivational aspects of self-efficacy to effectively promote sustained physical activity ([Li & Mu, 2021](#)) ([Ibeneme et al., 2024](#)).

This dynamic interplay highlights that fostering robust self-efficacy is crucial for transforming intentions into consistent physical activity habits and for overcoming potential barriers ([Gardner et al., 2019](#)). In fact, numerous studies confirm that self-efficacy partially mediates the relationship between exercise motivation and physical activity ([Tao et al., 2024](#)), indicating its pivotal role in translating motivational impetus into behavioral outcomes. This understanding is crucial for designing interventions that not only instigate initial engagement but also foster the psychological resilience required for long-term adherence to exercise programs ([Tao et al., 2024](#)). Consequently, interventions targeting multiple social cognitive theory variables, including self-efficacy, have been shown to effectively increase physical activity levels, particularly in older adults ([Mardany et al., 2024](#)). Such programs acknowledge that tailored approaches are essential for addressing the diverse needs and motivational incentives of different demographic groups ([Mardany et al., 2024](#)). This further supports the notion that a holistic approach, integrating self-efficacy enhancement with other motivational strategies, yields superior outcomes in promoting sustainable health behaviors ([O'Neil-Pirozzi et al., 2022](#)) ([Łuszczynska & Schwarzer, 2020](#)). Furthermore, self-efficacy is a potent predictor of adherence to physical activity, with individuals possessing higher self-efficacy exhibiting greater persistence in their exercise routines ([Galarraga et al., 2020](#)) ([Tao et al., 2024](#)). This sustained engagement is often facilitated by perceived competence and beliefs in one's capabilities to organize and execute necessary actions ([Bachner et al., 2020](#)). This underscores the importance of fostering self-efficacy through targeted interventions that build confidence and provide opportunities for mastery experiences, thereby encouraging sustained participation



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in physical activity ([Mardany et al., 2024](#)). Specifically, an optimistic mindset and intrinsic motivation, alongside self-efficacy, are critical for older adults' engagement in physical activity, contributing significantly to their daily coping strategies and overall psychological well-being ([Lee et al., 2020](#)). This intricate relationship suggests that interventions aimed at promoting physical activity should prioritize enhancing self-efficacy alongside addressing other motivational and cognitive factors ([McAuley et al., 2011](#)) ([Mardany et al., 2024](#)).

This foundational role of self-efficacy suggests that tailored interventions promoting self-efficacy through education and practical application can significantly enhance long-term physical activity engagement among older adults ([Mardany et al., 2024](#)) ([Anderson-Bill et al., 2011](#)) ([Neupert et al., 2009](#)). The efficacy of such interventions is further supported by evidence demonstrating that both cognitive-based and combination interventions are more successful in changing physical activity behavior, with behavioral-based interventions showing more long-term effects ([Chase, 2013](#)). This indicates that a comprehensive approach integrating cognitive restructuring with behavioral strategies is optimal for fostering sustainable physical activity adherence ([Larsen & Gibson, 2020](#)). This highlights the importance of incorporating varied experiences and skill-building opportunities to reinforce individuals' belief in their capacity to engage in and maintain physical activity ([Singh et al., 2022](#)). These insights underscore that self-efficacy is not merely a psychological construct but a critical determinant of behavioral change, particularly in the context of health promotion. This is especially pertinent for older adults, where low self-efficacy is frequently a significant barrier to maintaining consistent physical activity, impacting their overall functional performance and reducing disability risk ([Mardany et al., 2024](#)) ([McAuley et al., 2011](#)). Given these insights, interventions for older adults should therefore consider strategies to amplify self-efficacy to augment their propensity to engage in and sustain healthy behaviors, as evidenced by national health initiatives ([Wang & Liu, 2023](#)). This includes emphasizing satisfaction with physical activity achievements, providing opportunities for success, and fostering positive emotional responses to exercise to enhance self-efficacy and continued engagement ([Kendrick et al., 2018](#)). These strategies are crucial for establishing a positive feedback loop where successful engagement reinforces self-belief, thereby promoting sustained participation in physical activity and mitigating the negative impacts of physical inactivity. Moreover, psychological and social factors are



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considered modifiable influences that significantly impact physical activity participation, often mediating the effects of non-modifiable factors like age ([Zhang et al., 2022](#)).

Therefore, effective interventions often integrate social cognitive theory principles, focusing on self-efficacy, outcome expectations, and social support, to foster behavioral changes that lead to increased physical activity ([Mardany et al., 2024](#)). For instance, pedometer-based walking programs, grounded in interpersonal health behavior theory, have been shown to enhance physical activity and yield antihypertensive effects in community-dwelling older adults ([Ibeneme et al., 2024](#)). Such programs highlight the importance of considering the dynamic interplay between different environmental systems and social determinants in designing effective strategies for physical activity promotion ([Ibeneme et al., 2024](#)). These interventions, often incorporating self-regulatory components, are more successful when they explicitly address environmental barriers and facilitators to physical activity, demonstrating the necessity of a holistic ecological approach ([Ibeneme et al., 2024](#)). This multi-level approach recognizes that individual behavior is nested within broader social and environmental contexts, necessitating interventions that span individual, interpersonal, and community levels to achieve sustainable physical activity outcomes ([Lee & Fan, 2023](#)). This comprehensive understanding of factors influencing physical activity underscores the potential for interventions to combine individual-level theories, such as self-efficacy, with community-level behavior theories to yield more significant and sustained changes in physical activity behaviors ([Ibeneme et al., 2024](#)). However, despite the acknowledged importance of self-efficacy, some studies indicate that outcome expectations may also play a significant role in maintaining physical activity, sometimes surpassing self-efficacy in influence over time ([Piedra et al., 2018](#)). This suggests that while self-efficacy initiates engagement, the anticipated benefits and value derived from physical activity may be crucial for long-term adherence, particularly among older adults who often prioritize health outcomes ([Mardany et al., 2024](#)). Specifically, individuals are more likely to alter their behavior when they believe that contributing factors to outcomes are malleable and within their control, aligning with attribution theory where perceived control over outcomes motivates behavioral change ([Piedra et al., 2018](#)).

This interplay underscores the need for interventions that not only build confidence in one's ability to perform physical activity but also clearly articulate the tangible benefits and empower



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individuals to perceive their actions as directly influencing desired health outcomes ([Ashe et al., 2019](#)). Furthermore, a social ecological framework, which considers the complex interplay of individual, social, and environmental variables, provides a comprehensive lens through which to understand and address physical activity determinants ([Lee & Fan, 2023](#)) ([Dollman, 2018](#)). Such models integrate psychosocial factors like prior experiences, knowledge, attitudes, and motivation with contextual elements at organizational, ecological, and political levels to influence behavior change ([Wichmann et al., 2020](#)). The effectiveness of physical activity interventions can be significantly augmented by incorporating feedback mechanisms that acknowledge personal progress and individual fitness levels, alongside comparative data on activity levels among peers ([Peters et al., 2024](#)). This multi-faceted approach acknowledges that motivation for physical activity is not solely an internal construct but is profoundly shaped by an individual's social environment and perceptions of comparative performance ([Hinckson et al., 2017](#)) ([Rogowska & Morouço, 2024](#)). The fulfillment of outcome expectancies, particularly those related to emotional rewards, has been identified as a predominant predictor for successful and sustained behavioral change, often in conjunction with action self-efficacy ([Klusmann et al., 2016](#)). These emotional rewards, often intrinsically driven, are critical for maintaining long-term adherence to physical activity ([Rogowska & Morouço, 2024](#)). This intrinsic motivation, alongside basic psychological needs, plays a crucial role in shaping exercise behavior and overall well-being among older adults ([Rodrigues et al., 2023](#)). This highlights the importance of tailoring programs and environments to older adults, supporting their competence, autonomy, and relatedness to enhance motivation for maximal engagement in physical activity ([Mappanasingam et al., 2024](#)). Specifically, fostering an environment that cultivates feelings of competence, relatedness, and autonomy can significantly promote intrinsic motivation for physical activity in older adults ([Arnautovska et al., 2018](#)) ([Mappanasingam et al., 2024](#)). This internal drive, coupled with satisfaction derived from the activity itself, is more likely to lead to sustained engagement and habit formation, as opposed to solely extrinsic motivators ([Lynch et al., 2022](#)) ([Rodrigues et al., 2023](#)).

However, extrinsic motivators, such as recognition or competition, can also be effective, especially when aligned with an individual's goals and basic psychological needs, thereby contributing to overall life satisfaction ([Rodrigues et al., 2023](#)). Nonetheless, interventions that judiciously combine both intrinsic and extrinsic motivational strategies, particularly those



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leveraging behavior change techniques, have demonstrated the most robust and lasting impact on physical activity adherence in older populations ([Gilchrist et al., 2024](#)) ([Rodrigues et al., 2023](#)). For instance, interventions that emphasize intrinsic motivations such as enjoyment and accomplishment have been shown to predict long-term physical activity adherence and weight loss ([Kononova et al., 2018](#)). These intrinsic factors are often more effective than extrinsic motivators in promoting sustained engagement with physical activity, though a blend of both can be highly effective ([Mappanasingam et al., 2024](#)). Indeed, the interplay between intrinsic rewards, such as pleasure and satisfaction, and extrinsic motivators, like social encouragement or health benefits, is complex and varies among individuals ([Stødle et al., 2019](#)) ([Jones et al., 2019](#)). Studies indicate that older adults are often intrinsically motivated to improve their health, though external regulation can also play a significant role ([Velsen et al., 2019](#)). Ultimately, facilitating enjoyment and a sense of connection within physical activity pursuits is paramount for long-term adherence, a perspective supported by findings across various demographics ([Singh et al., 2022](#)) ([Mappanasingam et al., 2024](#)). This is particularly true for group-based interventions, where social interaction and shared experiences can foster a sense of community and reinforce intrinsic motivation ([Cross et al., 2023](#)). Furthermore, the perceived value and utility of physical activity outcomes are central to an individual's motivation, with expectations about health benefits and quality of life significantly influencing sustained participation ([Haynes et al., 2021](#)) ([Behzadnia et al., 2020](#)). This highlights that engagement in physical activity is often driven by a combination of factors, ranging from the inherent satisfaction derived from the activity itself (intrinsic motivation) to external pressures or rewards (extrinsic motivation) ([Molanorouzi et al., 2015](#)).

Intrinsic motivation, characterized by engaging in an activity for its inherent satisfaction and enjoyment, is linked to longer-term adherence to leisure-time physical activity regimens, while self-determined extrinsic motivations can also support maintenance of physical activity ([Stødle et al., 2019](#)) ([Geller et al., 2018](#)) ([Watson et al., 2024](#)). Specifically, studies indicate that satisfaction with outcomes, enjoyment of the behavior, and self-determination are strongly related to the maintenance of physical activity in older adults ([Huffman et al., 2020](#)). Conversely, a lack of perceived progress or immediate gratification can erode motivation, leading to decreased participation and adherence over time, particularly when extrinsic motivators are the primary drivers ([Wichmann et al., 2019](#)). Thus, while extrinsic factors like



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tangible rewards or social recognition can initially prompt engagement, the sustained commitment to physical activity often hinges on the development of intrinsically regulated motivations, such as the inherent pleasure or personal accomplishment derived from the activity itself ([Alajlan et al., 2024](#)) ([Stødle et al., 2019](#)). This perspective underscores the critical role of cultivating an internal locus of causality, where individuals engage in physical activity because they genuinely value its intrinsic benefits rather than solely for external incentives ([Molanorouzi et al., 2015](#)). This distinction is crucial for understanding why some individuals maintain physical activity over decades while others falter, emphasizing the nuanced relationship between motivation types and long-term behavioral patterns ([Geller et al., 2018](#)) ([Deng et al., 2022](#)). Specifically, activities that fulfill basic psychological needs for competence, autonomy, and relatedness are more likely to foster intrinsically motivated behaviors, leading to greater adherence ([Wikman et al., 2018](#)). This is particularly evident in studies on older adults, where sustained physical activity is often tied to feelings of purpose, social connection, and overcoming personal challenges, rather than merely external health directives ([Tappen et al., 2021](#)) ([Mappanasingam et al., 2024](#)).

Moreover, different forms of motivation, including external regulation, introjected regulation, identified regulation, and integrated regulation, all fall under the umbrella of extrinsic motivation but vary in their degree of autonomy and perceived control ([Velsen et al., 2019](#)) ([Antunes et al., 2022](#)). These regulatory styles range from external pressures to highly internalized values, with more self-determined forms of extrinsic motivation, such as integrated regulation, demonstrating stronger associations with long-term physical activity maintenance than less autonomous forms like external regulation ([Gagnon et al., 2018](#)).

Conclusion

Amotivation, at the opposite end of the spectrum from intrinsic motivation, signifies a complete lack of intention or desire to engage in physical activity, often stemming from feelings of incompetence or a lack of perceived value ([Prieto-González et al., 2025](#)). This motivational continuum, as elucidated by Self-Determination Theory, highlights how varying degrees of internalization and perceived locus of causality influence an individual's engagement and



persistence in health-related behaviors ([Burgueño et al., 2022](#)) ([Stehr et al., 2021](#)). Within this framework, autonomous motivation, encompassing intrinsic and identified regulation, is particularly salient for promoting sustained physical activity, as individuals engage in behaviors they find personally valuable or enjoyable ([Castonguay & Miquelon, 2018](#)). This continuum illustrates how behaviors driven by internal factors or personally endorsed external reasons are more likely to result in long-term adherence to physical activity ([Blevins et al., 2017](#)) ([Deng et al., 2023](#)) ([Castonguay & Miquelon, 2018](#)). This emphasis on autonomous motivation aligns with Self-Determination Theory's postulation that behaviors are more likely to be maintained when they are self-determined, as opposed to being controlled by external rewards or pressures ([Manzano-Sánchez, 2023](#)) ([Ostendorf et al., 2021](#)).

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