Chapter 1
Introduction to Exercise Psychology

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Chapter Overview

Within this chapter, you will be introduced to the field of Exercise Psychology and how it differs from Sport Psychology. This chapter attempts to (a) differentiate Exercise and Sport Psychology, (b) provide an overview of the themes of Exercise Psychology, (c) introduce the various scientific approaches to studying Exercise Psychology and their unique contributions, and (d) emphasize the importance of considering various perspectives in order to fully understand physical activity behavior.

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An Introduction to Exercise Psychology

Exercise and Sport Psychology investigates the psychological antecedents and consequences of physical activity behavior. This includes: (a) understanding factors that predispose individuals to avoid or engage in physical activity (e.g., motivation, individual differences); (b) understanding how engagement in physical activity influences an individual's general well-being (e.g., self-esteem, mental health) throughout the lifespan; and (c) the application of psychological principles to improve athletic well-being and performance (APA Division 47). In such endeavors, the study of Exercise and Sport Psychology intertwines concepts, theories, and knowledge across a wide variety of scientific disciplines (e.g., Sport and Exercise Science, Psychology, Sociology, Neuroscience, Physical Science, and Health Science). Before examining the various perspectives taken by Exercise and Sport Psychology, it is worthwhile to become familiar with some terms related to physical activity.

Physical Activity refers to any bodily movement that results in a substantial increase in caloric (energy) expenditure beyond resting values (ACSM, 2018). Therefore, physical activity refers to numerous types of activities, including household (e.g., vacuuming, car washing, doing laundry), leisure-time (e.g., trail walking, kayaking), transportation (e.g., walking or biking to school/work), and occupational (e.g., heavy lifting, carrying objects) physical activities along with exercise (e.g., running, weight lifting) and sport (e.g., basketball, soccer, boxing). Even though exercise and sport[1] activities more readily come to mind when considering types of physical activity, they are simply subcomponents of physical activity.

Exercise and Sport Psychology, while appearing to be a single area of study by title, are actually considered two distinct content areas, namely Exercise Psychology and Sport Psychology. *Exercise Psychology* is concerned with the antecedents and consequences of physical activity behavior (including, but not limited to, exercise). Meanwhile, *Sport Psychology* is concerned with psychological principles as they relate to athletes and athletic performance. This chapter will focus on the common goals and approaches of Exercise Psychology, while Sport Psychology will be discussed in more detail elsewhere (see Chapter 19; Hill & Mellano, 2021).

While the term "exercise" will be primarily used throughout the rest of this chapter, it should be made clear that the study of Exercise Psychology is interested in all forms of physical activity (e.g., household, leisure-time, transportation, occupational, exercise, and sport), not just structured exercise, and is often studied in the context of the general population or specific subgroups of the population (e.g., individuals with depression, individuals with autism). Research and study in Exercise Psychology is generally divided into three, broad themes:

- **Exercise Behavior Promotion**: Here priority is given to the influence of internal and external variables as constraints and facilitators to the initiation of, and lifelong adherence to, physical activity behavior.

- **Dynamic Exercise Psychology**: This refers to the basic science of psychological phenomena that occur while engaged in physical activity, or the "state of the mind" and its relation to the body during physical activity.

[1] Exercise is defined as planned, structured, and repetitive bodily movements that are carried out to improve and maintain at least one component of health or physical fitness. Sport, on the other hand, generally refers to competitive physical activity engagement, completed alone or with a group that requires physical skills and often provides a means of entertainment.

- **Exercise and Health Psychology**: Research in this theme considers the effects of physical activity on psychological development and health. Areas of interest include mental disorders, cognitive performance, emotion regulation, social engagement, and other areas including and beyond physical health.

Approaches to Studying Exercise Psychology

Similar to the parent discipline of Psychology, the field of Exercise Psychology makes use of several perspectives (i.e., affective, biological, cognitive, personality, sociological) in order to understand the various psychological phenomena of physical activity. These various approaches to the study of Exercise Psychology, while using different methodologies and measures, ultimately provide a more inclusive and complete understanding about why and how we engage in physical activity. They also offer the potential to explain why and how physical activity influences our thoughts, feelings, social interactions, and behavior.

A general assumption made within Exercise Psychology is that a person's feelings and thoughts are intimately intertwined with their physical state. This is referred to as "monism", that is, the mind and body are components of a single unit, not separate entities[2]. Consider the mechanism of a gear train, illustrated in Figure 1.1. An interlocked gear train is dependent on the successful movement of all connected gears and impeding or accelerating a single gear will impact the entire system. A single gear within a gear train is analogous to a single mental or physical component within an individual; just as one gear can influence an entire gear train, so too can a single mental or physical component influence the entire individual.

To illustrate this idea in the context of physical activity, imagine you have just been asked to participate in a race with your classmates from one end of the hallway to the other. Take a moment to really visualize what you are being asked to do. Now consider how you feel[3]: are you nervous, excited, apathetic, or somewhere in between? What are you thinking: are you rationalizing reasons for why you may not win or even participate? Now reflect on your physical state: did your heart rate increase? Did you feel a sense of energy pulsing through your body? Did you produce a smile or a scowl?

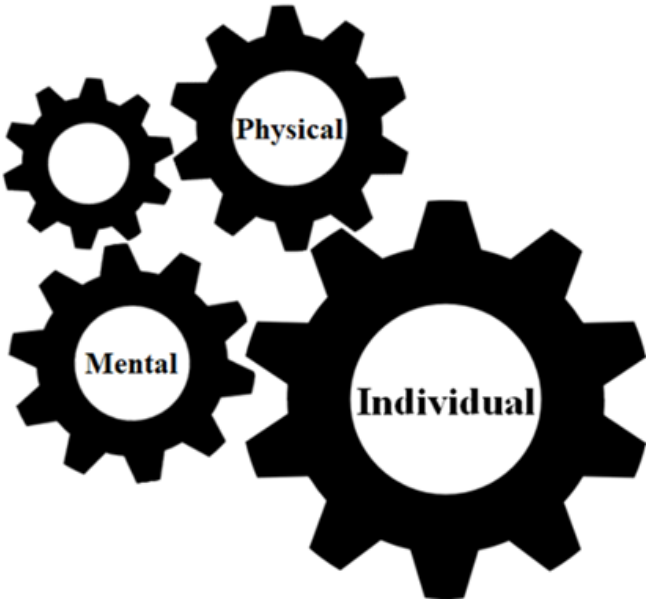
Upon reflection of what occurred, did the feelings and thoughts produce the physical state changes or did the physical state changes produce the feelings and thoughts? This is a main, albeit philosophical, question asked by scientists studying the mind–body connection. Regardless of which came first, or if they occurred simultaneously, an important takeaway is that mind and body are so intimately intertwined that a change in psychological state will occur with a change in physical state, and vice versa. This is an important concept to understand in Exercise Psychology, as the assumption of the mind–body connection is paramount for studying the effects of acute and long-term physical activity. If the assumption of the connection between the mind and body were denied (i.e., dualism), it becomes difficult, for example, to support the notion that individual differences (e.g., personality, sense of autonomy, self-confidence) influence the likelihood of physical activity behavior or to explain changes in psychological factors (e.g., the reduction in depressive symptoms) resulting from physical activity. Thus, when examining Exercise Psychology from the various perspectives, it is important to keep in mind that a change in a mental or physical component of the individual simultaneously alters all other components

[2] Whereas monism is the belief that mind and body are inseparable, dualism takes the position that mind and body are separate entities and can be studied independently of one another.

[3] *Introspection*: Generally referred to as the examination or observation of one's own mental (feeling) states. *Interoception*: The brain's representation of all sensations from your internal organs and tissues, which provides one's basic feeling of pleasantness or unpleasantness and wakefulness. Even without conscious awareness, interoceptive activity is always occurring within the brain, adjusting the body systems appropriately. Introspection is required to "tap into" your own interoceptive activity in order to articulate how you may feel.

of the individual, and these changing components subsequently influence the way the individual may interact with their environment.

Figure 1.1
The Human Gear Train



Affective Perspective

Affective science is the broad study of feeling states. This perspective often provides philosophical arguments for the mind–body connection, investigates feeling states as motivators for and outcomes of behavior, and delves into the intricacies of affective disorders (e.g., depression, anxiety, stress disorders). Endeavors in the affective perspective in Exercise Psychology are important because, theoretically, humans have an innate tendency to pursue pleasure and avoid displeasure or pain, a school of thought referred to as Hedonics or Psychological Hedonism (Ekkekakis, 2014; Rozin, 1999; Young, 1952). However, humans are also capable of applying thought and reason to "override" such innate desires. A person is thus motivated, at least to some degree, to engage (or not) in physical activity because of their current and expected feeling states.

In addition, accumulated evidence suggests acute and long-term physical activity behavior can reduce anxiety, depressive states, and has a stress-buffering effect in healthy individuals as well as in those diagnosed with Anxiety, Depressive, and Stress disorders (Biddle, 2016; Landers & Arent, 2007; Scully et al., 1998). As recognition of mental health (i.e., referring to an individual's psychological and emotional well-being) continues to spread, there is a great need to understand whether particular health behaviors (e.g., physical activity) can buffer against, improve resilience to, or aid in the treatment of mental health challenges (Teychenne et al., 2020).

Given some evidence of the importance of affective states, it should be made clear that feeling states alone do not provide enough information to satisfy the complete understanding of antecedents and consequences of physical activity behavior. Only studying feeling states oversimplifies motivations for behavior and subtly suggests that only feelings can be influenced by physical activity. This could not be further from the truth. As alluded to earlier, feeling states are not only intertwined with physical (biological) states and cognition (i.e., thoughts, reason), but also become a piece of one's identity (personality) and are prevalent in social interactions.

Photo by Andres Ayrton from Pexels

Biological Perspective

Biological science refers broadly to the study of living organisms, understanding the physiological mechanisms underlying how these organisms function, and adaptations that are made to deal with changing environments (both internal and external). The biological perspective considers many areas of study, including (but not limited to) biochemistry, endocrinology, neuroscience, and electrophysiology. Those incorporating a biological perspective in the study of Exercise Psychology may take on different titles to more appropriately address how they are studying psycho-physiological phenomenon (e.g., Exercise Psychophysiologist, Exercise Psychobiologist, Exercise Neuroscientist). Regardless of the title and which area of study (and similar to the affective perspective), the biological perspective attempts to understand the mind–body connection (i.e., how physical states relate to mental states), investigates physical states as facilitators of and barriers to behavior, and explores the complexities of a broad range of psychological phenomena, including mental disorders/diseases. As you may have gathered, incorporating a biological perspective in Exercise Psychology encompasses numerous methods of assessing physical states in relation to psychological phenomenon within the context of physical activity.

Taking an electrophysiological approach involves the study of the electrical properties of biological cells and tissues. Two prominent organs influenced by electrical properties are the heart and brain. While almost every bodily organ is influenced, or at least innervated, by the nervous system (to which sensory and motor information is passed via electrical signals), the heart and brain are primary sources of electrical activity and are often studied in relation to psychological phenomena. Electrical activity of the heart and brain can be assessed via electrocardiography (ECG/EKG) and electroencephalography (EEG), respectively, through surface (on the skin) electrodes. Indeed, evidence from EKG studies have linked more consistent heart beats[4] with negative affect (e.g., depressed, sad), while evidence from EEG studies has also linked greater relative brain activity in the frontal lobe over

[4] At rest, there is usually beat-to-beat variability in which consecutive heart beats may be separated by 0.6 seconds, then 1.3 seconds, and then 0.9 seconds. This inter-beat variability is reflected within Heart Rate Variability (HRV), a psychophysiological measurement of the beat-to-beat interval and is considered a valid index of autonomic nervous system innervation (Thayer et al., 2012).

the right hemisphere, when compared to the left hemisphere, with negative affect (Davidson, 2004; Thayer et al., 2012). In addition, these same heart and brain electrical patterns are associated with less physical activity engagement (Blom et al., 2009; Threadgill et al., 2020).

Another approach within the biological perspective is endocrinology, the study of the endocrine system and its secretions (i.e., hormones). Thus, taking an endocrinological approach within Exercise Psychology often involves a primary focus on the relationship between hormones and psychological phenomena. One of the most-studied phenomena within this context is stress and the influence of physical activity on the stress response as reflected in the release of stress hormones (e.g., catecholamines, cortisol). Building on this psycho-biological connection, research has demonstrated that regular physical activity behavior (and often greater fitness as a result of that activity) evokes favorable adaptations in the biological stress response. More specifically, individuals who are more physically active tend to respond more positively (or less negatively) to various types of stressors (e.g., exams, social conflict; Dienstbier, 1989; Sothmann et al., 1996). This has been demonstrated in terms of stress hormone profiles that are more adaptive (i.e., more catecholamines, less cortisol) in the reaction to the stressor and in a faster recovery once the stressor is over.

Even though several methods and techniques (e.g., electrophysiology, endocrinology, genetics, neuroscience) are used to explore relationships between physical and psychological states, the goal remains to develop a better understanding of psychological phenomena. While the biological perspective is interesting and informative, it does not provide a full understanding of the antecedents or consequences of physical activity behavior by itself. For example, studies investigating whether particular genomes are predictive of long-term exercise behavior may dismiss important confounders like social priorities (e.g., taking care of a child or parent), experienced feelings and thoughtful expectations, and so on. Thus, while the biological perspective adds to understanding Exercise Psychology, it cannot and should not stand alone.

Cognitive Perspective

Cognitive science encompasses a large, interdisciplinary field broadly concerned with understanding the mind and its processes. This includes investigating concepts of intelligence, language, memory, perception, and so on. Like the previously discussed perspectives, cognitive science is also interested in the mind–body connection and investigates higher-order psychological processing that occurs between some stimulus and the response for a given behavior. In addition, cognitive science examines the intricacies of various cognitive disorders (e.g., Attention Deficit Hyperactivity Disorder, Autism, Dementia). As Exercise Psychology is primarily interested in the antecedents and consequences of physical activity behavior, we will focus on cognition in the context of such behavior. In fact, research has demonstrated physical activity can both influence, and be influenced by, cognitive processes.

Cognitive functioning includes several cognitive processes (or abilities) that are needed for learning and critical thinking. This includes attention, memory, language, perception, and executive functioning. Within the physical activity context, the focus has been primarily on the cognitive process referred to as executive functioning, which has three primary components: updating, inhibiting, and shifting (Miyake & Friedman, 2012). The first component, updating, sometimes referred to as working memory, is the ability to maintain and update relevant information. Inhibition, also referred to as cognitive control, is the ability to intentionally constrain unwanted thoughts and behavior impulses. Lastly, shifting[5] is the ability to quickly and accurately switch between mental tasks.

[5] It is actually not possible to "multi-task" (i.e., perform multiple mental task at the same time). Thus, someone who is a good "multi-tasker" is actually very efficient at "shifting" or switching between multiple tasks (Miyake & Friedman, 2012).

Some theorists suggest a regulatory process occurs between the components of executive functioning and physical activity behavior such that greater executive functioning leads to more physical activity engagement, and more physical activity engagement improves executive functioning (Hall & Fong, 2007). Indeed, executive functioning has been shown to predict planned physical activity behavior (Hall et al., 2008), and a large body of evidence suggests regular physical activity behavior improves the components of executive functioning in children, adolescents, and adults (Colcombe & Kramer, 2003, 2018; Khan & Hillman, 2014). Moreover, physical activity behavior has been shown to protect against and slow the progression of memory disorders, such as Dementia and Alzheimer's (Rovio et al., 2005).

The cognitive perspective provides invaluable information on human thought and reason in the context of physical activity behavior. This perspective often implicitly assumes humans to be rational decision makers, but humans are not always rational. Thus, like any other perspective, the study of cognitive function only supplies a piece of the puzzle and should be considered alongside various other factors (e.g., feeling states, physical states, social contexts, physical environment) to more completely understand the dynamic intricacies of human behavior.

Personality Perspective

The study of Personality involves the exploration of various psychological characteristics and traits with the goal of understanding how these traits relate to behavior. This perspective investigates personality traits as facilitators and inhibitors of cognition, emotion, and behavior and also explores personality disorders (e.g., Bipolar Disorder, Obsessive-compulsive Personality Disorder). An individual's traits and characteristics develop and become relatively stable across the lifespan. The personality perspective in Exercise Psychology seeks to understand whether particular traits are commonly related to physical activity engagement either by facilitating or inhibiting engagement in physical activity or the extent to which physical activity might influence such traits (i.e., consequence).

A quick online search of "personality tests" results in numerous surveys offering to outline your personality upon completion. Given that self-exploration is often useful and helpful, these tests may provide information for such thoughtful and personal reflection. However, only a handful have been empirically demonstrated to be reliable and valid within the context of behavior. One such personality model is referred to as "The Big Five" or the five-factor model (Costa & McCrae, 1992; Digman, 1990; John et al., 1991). The Big Five consists of five, higher-order personality traits: Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (commonly referred to by its acronym OCEAN; John & Srivastava, 1999). In brief, the trait Openness to Experience is greatest for those who consistently seek out behaviors that are intellectual or imaginative in nature. Individuals with greater degrees of Conscientiousness are orderly, responsible, and dependable. Extraverts, in contrast to introverts, are talkative, assertive, energetic, and prefer (or do not mind) to be the center of attention. Those who exhibit greater degrees of Agreeableness are good natured, dependable, cooperative, and trustful. Lastly, Neuroticism is captured by the tendency to be emotionally reactive, easily upset, and "moody". Of these five traits, the constellation of higher extraversion, greater conscientiousness, and less neuroticism (or more emotional stability) has been most consistently linked with greater likelihood of physical activity engagement (Wilson & Dishman, 2015).

The personality perspective considers individual variability. As such, it considers how the individual, with their own set of personality characteristics, typically responds to and interacts with the environment. This perspective provides additional insight that may not be considered by other perspectives, but, again, it does not alone adequately explain the antecedents and consequences of physical activity behavior.

Social Perspective

Social science is broadly devoted to the study of social interaction and societies. Similar to the other perspectives, social science encompasses a broad range of major fields of study. These include, but are not limited to, anthropology, behavioral economics, and sociology. Together, these fields inquire how humans develop, behave, and adapt in response to positive and negative social interactions and social expectations within the context of a given group, institution, culture, or society more broadly. The social perspective in Exercise Psychology is primarily interested in understanding (a) how social relationships and interaction promote or hinder the likelihood of physical activity behavior, and (b) how social relationships mediate the influence of physical activity on an individual's well-being and quality of life.

Compelling evidence suggests social isolation, less social integration, and feelings of loneliness are risk factors for poor health and even early death (Berkman, 1995; Cacioppo & Cacioppo, 2018; House et al., 1988; Smith & Christakis, 2008). From a theoretical perspective, positive social interaction, social support, and feelings of relatedness (i.e., feeling connected to or having things in common with someone) are believed to promote initiation and adherence to health behaviors. Indeed, evidence supports the notion that social networks and perceptions of support are associated with greater physical activity behavior (Anderson et al., 2006; Hawkley et al., 2009; Watt et al., 2014).

Humans are innately social creatures, and thus understanding social dynamics is a worthy avenue of research. However, like the other perspectives, the social perspective alone fails to provide a full understanding of the natural complexity of human behavior. For example, if we only considered the social perspective, we would potentially lose individual variability within such social dynamics. Extraverted individuals are more adept in socially complex environments than their more introverted counterparts and thus are more likely to seek out a larger social network. This does not mean an introvert is inherently at greater risk of an early death because of their decision to spend less time engaged in socially stimulating environments. On the contrary, behavior, and the subsequent risk to health, must consider the individual as a whole.

Importance of Integration

Understanding human behavior, such as engaging (or not) in physical activity, is undeniably complex. Because of such complexity, Exercise Psychology is often studied in comprehensible "chunks" through the various perspectives described in this chapter. However, as the renowned neurobiologist Robert Sapolsky wrote, "the boundaries between different [perspectives] are often arbitrary, but once some arbitrary boundary exists, we forget that it is arbitrary and get way too impressed with its importance" (2017, p. 6). That is, the "perspectives" used to understand behavior are much like using a telescope to focus on a single star. Just because you are focused on a single star, and uniquely captivated by its impressiveness, does not mean the entire galaxy in which it resides disappears. On the contrary, the galaxy continues to not only exist outside of our scope or perspective, but is also in motion, continuously affected by the properties of stars, planets, gas clouds, debris, black holes, dark matter and so on. Thus, it is imperative in the exploration of the intricacies of human behavior, even within the context of physical activity, to keep in mind each perspective "zooms" into a single component of a much more complex entity.

Learning Exercises

1. How does Exercise Psychology differ from Sport Psychology?
2. What are the three main themes typically studied within Exercise Psychology?
3. What were the different scientific approaches discussed? Briefly explain each.
4. Can physical activity behavior be fully and reliably explained by a single perspective?

Further Reading

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