



Historical Trends in Motivation Research

2

Heinz Heckhausen

2.1 Introduction

Attempts to explain human behavior date back to the dawn of time. Questions relating to motives, motivation, and volition have been addressed from various perspectives under different labels and have prompted a variety of explanatory models. What is common to all these attempts is that they seek to establish the reasons for actions; their individual differences; and for the activation, control, and persistence of goal-oriented behavior. It would go beyond the scope of this chapter to review the intricate and involved history of this endeavor (see Bolles, 1975, for such a review). What Hermann Ebbinghaus (1850–1909) supposedly said about psychology, namely, that it has a long past but a short history, applies equally to the study of motivation.

Once psychology became scientific, i.e., experimental, questions relating to motivation began to emerge in quite different contexts. Labels and definitions differed, reflecting the changing perspectives on the issues. The connotative content of concepts also changed with the biases and assumptions that dominated a particular era, however, increasing or decreasing their popularity. The nomenclature at the beginning of the last cen-

tury is a case in point. At that time, the battle was between “motives” and “reasons” as directing the choice between alternative courses of behavior or as governing the emergence of a decision to do or not to do something. It was then that volition or “will” took effect to insure that an intention, once formed, would be followed up by the active pursuit of a goal. This applied particularly when resistance was to be overcome, be it in the form of countertendencies within the person or adverse environmental conditions. “Will” was often conceived as the guardian of moral norms and of duty, responsible for prevailing over “baser” tendencies such as “instinct,” “drives,” and “basic needs.”

Just four or five decades later, completely new ideas and concepts had gained currency. Not only had the distinction between the morally good and reasonable on the one hand and the impassioned and impetuous on the other disappeared, but “will” had lost all credibility as a scientific concept. At the same time, “drives” and “needs” had lost their animalistic character and now applied to higher human striving as well.

Moreover, questions of motivation were now being addressed in many other psychological contexts going far beyond the explanation of actions and learning outcomes. “Motivation” was now seen to have explanatory value for apparently automated processes such as perception, imagination, and thought. This brought about the gradual development of the psychology of motivation as

H. Heckhausen (✉) (deceased)
Max Planck Institute for Psychological Research,
Munich, Germany

an independent field of research with its own concepts, methods, and theories.

At the beginning of the twentieth century, motivational questions were still essentially centered on volition (decision-making, choice behavior) and the volitional act (intentional behavior). “Motives” were merely seen as justifications for volitional decisions (Ach, 1910; James, 1890; Pfänder, 1911). It was not until 1936, with the publication of P. T. Young’s *Motivation and Behavior* that the word “motivation” was first used in a book title. Now it was no longer volition that controlled access to and execution of an action, but needs and tendencies that were assumed to determine behavior in accordance with their strength. Just 20 years later, the numbers of monographs, reviews, and handbooks on questions of motivation had swelled and continued to do so. With the annual *Nebraska Symposium on Motivation* (first published in 1953) at the forefront, handbooks include Koch (1959–1963) and Thomae (1965), and textbooks providing a more or less comprehensive coverage of the subject were published by Atkinson (1964), Atkinson and Birch (1978), Bolles (1967, 1975), Cofer and Appley (1964), Madsen (1959, 1974), Heckhausen (1980), Weiner (1972, 1980), McClelland (1985), and Winter (1996).

At present, the psychology of motivation is still far from being a coherent enterprise in terms of its issues, variables, methods, and theories. This makes it all the more important to trace the historical roots of contemporary research issues from their beginnings, more than a century ago. We start at the beginning of the last century, with a generation of pioneers who initiated many of the approaches that are still being pursued today. On this basis, we track individual strands of research, some with distinct but interconnecting branches, to the present state of the art.

2.2 The Generation of Pioneers

Traditionally, philosophy and theology have viewed humans as organisms endowed with reason and free will. This is what distinguishes us from animals, gives us dignity, and makes us responsible for our actions. This view of humankind leaves

barely any scope for questions on the nature of human behavior. Humans are creatures of reason and therefore act rationally, in response to reasonable motives and legitimate values. Since humans are endowed with free will, it would be inappropriate and indeed pointless to explain their behavior in terms of external forces, be these within the environment or within the body. Admittedly, there may be some situations in which rational behavior and free-will decisions are encroached upon by “lower” motives or passions. Over the centuries, and with the development of scientific thought, this general idea of human behavior (of which our coverage here is very simplified) has been repeatedly called into question. Challenges have been raised by those who see human behavior as dependent on physical or physiological features of the organism, as well as by those who posit a hedonistic principle, i.e., behavior is driven by the organism’s pursuit of pleasure and avoidance of displeasure. Yet the Cartesian distinction between humans and animals remained: animal behavior does not derive from reason or free will, but is driven by blind natural forces, i.e., instincts.

This dualistic view began to crumble with Darwin’s book *The Origin of Species* (1859). According to Darwin (1809–1882), all differences in the physical characteristics and behaviors of organisms can be explained in terms of two principles:

- Random variation
- Natural selection of the fittest

Given that both of these principles were causally determined, it seemed reasonable to explain human behavior along deterministic lines as well, i.e., to attribute it purely to natural causes.

2.2.1 Roots in Evolutionary Theory

Aside from this breakthrough, which led to the long-held notion of ontological differences between humans and animals being replaced by a deterministic view of human motivation and behavior, the three assumptions outlined below played a major role in the development of research on motivation.

Instincts and Drives If there is no qualitative ontological difference between species of animals and humans, but rather a gradual progression, then explanations for animal behavior must have certain validity for human behavior as well.

This insight led to a search for the instincts and drives that motivate human behavior. For McDougall, instincts became the major explanatory concept. He published his first list of instincts in 1908, founding the *instinct theory approach* to the study of motivation, which is still reflected in ethology (Lorenz, Tinbergen) and contemporary sociobiology (Dawkins, 1976; Hamilton, 1964; Trivers, 1971). At the same time, Freud was attempting to elucidate apparently irrational phenomena such as the content of dreams (1900/1952a) and the behavior of neurotic patients (1915/1952c), which he attributed to hidden drives. In so doing, he became the founder of a major branch of the *personality theory* approach to motivation.

To the extent that humankind lost its special status in nature in the wake of evolutionary theory, it also lost its “free will.” As a result, the concept of “will” fell out of favor in scientific circles, disappearing completely from the scientific parlance of most psychologists by the 1940s. Some, like Freud and McDougall, were quick to accept the deterministic view engendered by Darwinian theory. Others continued to adhere to philosophical traditions and phenomenological approaches and took another two or three decades to reach this point. This was the case in Germany, where there was a remarkable upswing in the psychology of the will after the turn of the last century.

Adaptation to Environmental Conditions

Given that an organism’s ability to adapt to a changing environment determines its fitness to survive and reproduce on the long term, human intelligence must be seen not as something unique but as something that has evolved over the millennia. Intelligence, i.e., the ability to learn from experience, must have a significant survival function, because it permits rapid adaptation to changed environmental conditions. This would mean that the species of animals still existing today must have rudimentary forms of intelligence.

This view was the basis for the development of comparative psychology in the 1880s, with its endeavors to identify and compare features of species-specific intelligence. Anecdotal observations and speculative comparisons gradually gave way to the systematic and experimental study of learning, pioneered by Thorndike (1874–1949). Thorndike conducted his first animal experiments in the basement of the home of his teacher, William James (Thorndike, 1898, 1911). James (1842–1910) was a remarkable mediator between the old and the new psychology. With his unequalled talent for introspection, he engaged in a phenomenological analysis of volitional acts, examining the role of consciousness. He retained the notion of free will, but held that humans were also endowed with a number of instincts. According to James, consciousness, which is uniquely human, evolved “for the sake of steering a nervous system grown too complex to regulate itself” (James, 1890, Vol. 1, p. 144).

James himself never experimented, but it was he who coined the term “habit,” which was to become a central concept of associationist learning theories.

Definition

The term “habit” implies an automated behavioral sequence; James held that these behaviors had, at one time, been under conscious control.

Darwin had already seen instinct as a kind of intelligence-like adaptive mechanism and as a particular case of natural selection. In order to be able to apply his second principle, accidental variation, to instincts, he considered them to be collections of individual reflex units. Very gradual changes and advances in these collections of reflexes thus became plausible, true to the theory of evolution. This meant that instincts in animal and human behavior no longer had to be seen as global entities. Rather, they could be analyzed in terms of objectifiable stimulus-response associations. The reflex arc subsequently became the basic element of behavior and, around the turn of

the last century, the Russian physiologist Pavlov (English translation 1927) laid the foundations for another branch to the experimental study of learning beside Thorndike's. Both continue to influence the study of motivation.

Thorndike and Pavlov were founders of what has been called the *associationist approach* to motivation research. Both dealt with changes in stimulus-response associations. In Thorndike's work, earlier responses are replaced by more successful ones (instrumental or operant conditioning), whereas in Pavlov's approach, the stimuli that originally elicited a response are replaced by formerly neutral ones (classical conditioning).

- Thorndike founded the learning branch of the associationist approach to the study of motivation, while Pavlov founded its activation branch.

Natural Selection and Survival of the Fittest The physical and behavioral characteristics that Darwin hypothesized to represent an advantage for natural selection are not just generalized characteristics specific to the species existing today. Within a species, there must always be individuals that are somewhat better equipped than others for the "fight for survival" under the prevailing environmental conditions.

This conclusion sparked an interest in individual differences and their diagnostic assessment.

Galton (1822–1911), a cousin of Darwin, carried out a number of studies related to heredity and eugenics. Along with the French researcher Binet (1857–1911), who developed the first intelligence test in the early 1900s, Galton founded the psychology of testing, a movement that developed independent of mainstream psychology, particularly in the United States. It was not until the 1930s that the testing movement began to influence the personality theory approach to motivation through the works of Allport (1937), Murray (1938), and Cattell (1950).

Summary

Assumptions derived from and/or supported by the theory of evolution, transformed the old psy-

chology of the human will into a psychology of motivation that accounts for individual differences and that, in a broad sense, also applies to animals. Yet they also facilitated that the psychology of will, which had enjoyed great popularity prior to World War I, was sidelined for several decades.

2.2.2 Roots in Psychological Thought

The pioneer generation also advanced a long-established tradition – that of philosophical and psychological speculations about human will. Not only was this tradition relatively immune to Darwinism; it reached its apex at the turn of the last century with the formulation of numerous theories. Along with sensations, ideas, and feelings, there were attempts to establish "volition" as a psychological experiential phenomenon and to determine the effects of "will."

Analysis of Volitional Processes in Consciousness The volitional act became a central theme for Wilhelm Wundt (1832–1920), the founder of experimental psychology. Wundt (1894) saw the volitional act as the organizing principle behind an individual's experience and actions, as a "psychological causality" to be distinguished from "physical causality," the laws of which were to be investigated by natural scientists.

The analysis of volitional processes through introspection and reaction-time studies led Wundt's contemporaries to espouse differing positions. Significant progress was made by members of the Würzburg school led by Oskar Külpe (1862–1915), a student of Wundt. Their analyses of thought processes failed to identify any conscious underlying processes. This led them to assume that there are unconscious attitudes and tendencies, generated by the task at hand, that control the cognitive processes without awareness, let alone voluntary control. Narziss Ach (1871–1946) interpreted this phenomenon in terms of a psychology of the will and, in 1905, coined the term "determining tendency" ("determinierende Tendenz").

- Narziss Ach and the Belgian researcher Albert Michotte (1881–1965), working independently, became the founders of an experimental psychology of the will. Regrettably, its popularity was short-lived, and it laid dormant for several decades before being revived more recently.

That completes the gallery of those who pioneered the study of motivation at the turn of the last century (for a similar overview, cf. Madsen, 1974). The five members of the pioneer generation are presented in Fig. 2.1:

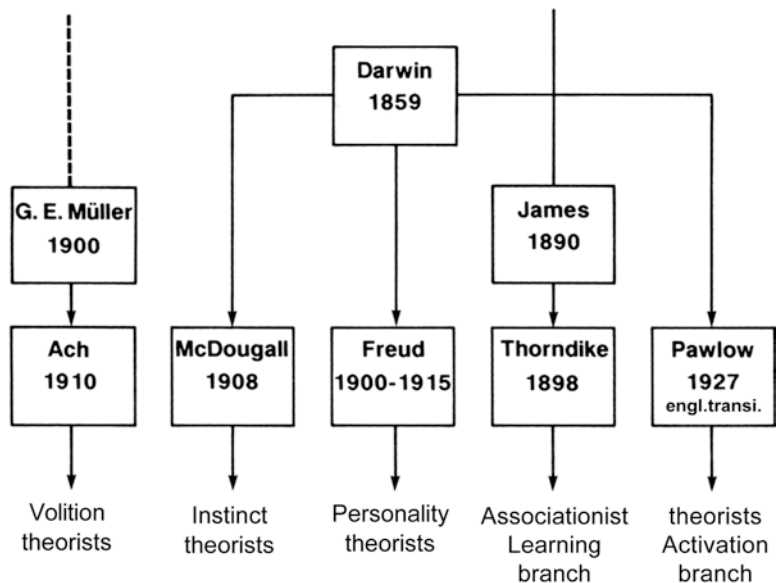
- Ach, who initiated an experimental approach to the psychology of the will
- McDougall, who founded the instinct theory approach
- Freud, who created the conceptual foundation for personality theories
- Thorndike and Pavlov, the founders of the learning and the activation branch of the associationist approach.

These five approaches, only four of which have significantly influenced the study of motivation over the past 70 years, present a remarkably one-sided view of the subject. Comparison with

the three major areas of motivational research – i.e., “motive,” “motivation,” and “volition” – shows that only “motivation” is covered in all five approaches. “Motives” are relevant only to the personality theory approach, and the “volition” aspect disappeared with the early demise of the experimental psychology of the will (though, to some extent, it resurfaced and survived elsewhere under different names and in different contexts, e.g., research on decision-making). Darwin’s theory of evolution cast doubt on the notion of humankind having a special status in nature and heralded a new, deterministic view of human behavior, which could then be studied by scientific methods. This focused attention on characteristics humans share with other species that had previously been overlooked, namely, a dependence on the satisfaction of basic needs and the attendant necessity to learn, often under adverse conditions. These characteristics have since been the subject of much research, as will be shown below. Moreover, motivation research has again begun to consider human capacities for volitional action, i.e., the psychology of the will. It will, however, take some time to make up for past neglect.

In the following, we will trace the individual strands of research and approaches to the

Fig. 2.1 Strands contributing to motivation research in the pioneer generation at the turn of the last century (Based on Madsen, 1974, p. 91)



study of motivation as they developed over the past century, highlighting the interconnections between them.

2.3 The Psychology of the Will

Since the works of Plato and Aristotle, it has been common practice to assume a triad of psychological functions, distinguishing between thinking, feeling, and willing or in terms of their respective capacities:

- Cognition
- Emotion
- Motivation

The functions are sometimes differentiated further – thinking, in particular, has been broken down into sensing, perceiving, and reasoning. Conversely, there have been repeated attempts to subsume willing – although it has always been acknowledged to be an undeniable and unique form of experience – to one of the other two members of the Platonic triad.

There have been few attempts to negate the existence of the will altogether. It was arguably the English empiricist David Hume (1711–1776) who went furthest along this path. Hume strived to avoid using metaphysical or a priori concepts to explain psychological functions, preferring instead to attribute all mental processes to impressions and ideas and to the associations that link them. The principles of causality and substance seemed to obviate self-awareness and volition as explanatory concepts – these were in fact products of our imagination deriving from experience and association.

2.3.1 Heterogenetic Perspectives

“Heterogenetic” theories of the will were less radical. They did not deny the phenomenal existence of will, but attributed it to manifestations and entities beyond volition itself. Depending on the assumed source of volitional experiences,

affective, ideational, sensory, and intellectual theories of the will can be identified. However, those who conceptualized volition as an independent entity, not attributable to other manifestations, were proponents of an “autogenetic” theory of the will.

At the turn of the last century, most psychologists took a heterogenetic position. It is no longer easy to see things from their perspective, but the assumption was that the essential elements of psychological functioning could be studied by means of trained *introspection*. The descriptive identification of what were assumed to be essential classes of experience, capable of being observed introspectively and communicated to others, appeared to be at least as important as the experimental analysis of conditions that permitted inferences to be drawn about underlying but nonobservable processes.

- Heterogenetic theories of the will arose from the endeavor to determine the nature of volitional acts by means of introspection alone.

For many, this approach was attractive because it did not require laborious experimentation. Assumptions could be derived from mere armchair speculations. For example, Herrmann Ebbinghaus (1850–1909), the celebrated founder of the experimental psychology of memory, was also a proponent of a heterogenetic affective theory of the will (Ebbinghaus, 1902). Münsterberg (1863–1916) and Wundt’s student Külpe (1862–1915) considered sensations to be the basis for volitional experiences. Münsterberg (1888) held that willing consisted of muscular sensations that preceded expected movements. Külpe (1893) conceptualized willing as a “keen organic sensation.”

An intellectual theory – today it would be called a cognitive theory – was proposed by Ernst Meumann (1862–1915), another of Wundt’s students, who posited that:

Will is no more than a specific course of intellectual processes, converting our assent to a goal into action. They permit the purely internal psychological experiences to become externalized operators on the environment. (Meumann, 1st ed. 1908, 1913, p. 347)

Despite its antiquated terminology, Meumann's approach has much in common with modern notions. It has become increasingly popular to offer cognitive explanations for motivational phenomena and, since the "cognitive revolution" in psychology, efforts have been underway to derive dynamic processes of motivation and volition from the very associative network models that were originally postulated to explain the structure and application of knowledge (Anderson, 1983; Norman, 1980).

Meumann also identified two further points that were rediscovered by and are now emphasized by contemporary motivational psychology:

1. Different temporal aspects of the goal structures of actions: Awareness may focus on the immediate outcome of an action or on its subsequent consequences (the latter were long overlooked as motivational factors, cf. Heckhausen, 1977b; Vroom, 1964).
2. Actors' awareness of being the authors of their actions: The sense of responsibility became a cornerstone of attribution research (Weiner, Heckhausen, Meyer, & Cook, 1972).

To the grandmaster Wundt, however, volition was not a heterogenetic but an autogenetic phenomenon. For him, all of the processes involved in what is now known as information processing were driven by volitional acts. This applied to aspects of attention and apperception, in particular, but also to perceptions, thoughts, and memories (Wundt, 1874, 1896; cf. the more recent coverage in Mischel, 1970).

Summary

Wundt saw the volitional process as an independent synthesis of antecedent affects that were originally (i.e., in ontogenetic development) dissipated in pantomimic gestures. To this were added combinations of ideas and feelings that he called "motives." He labeled their ideational components "Beweggründe" (underlying reasons) and their affective components "Triebfeder" (driving forces). In other words, Wundt distinguished motivational from volitional processes; he attempted to infer the volitional process from its developmental origins.

2.3.2 Phenomenological Perspectives

While Wundt's volitional theory consists of highly abstract propositions, William James (1890) engaged in a phenomenological analysis of anecdotal material in an attempt to pinpoint the actual volitional act; i.e., the point at which a decision, a "fiat!," or an inner consensus terminates the "deliberative state" and from which point an action is determined by just one of the alternatives available. James was almost surprised to find that it is not always necessary for this point to be reached; sometimes the mental representation of an action is enough to trigger it.

The classic example of getting up on a cold winter's morning illustrates how this *ideomotor principle* seems to obviate the need for a volitional act.

William James gave an example of the ideomotor principle from everyday life:

Example

If I may generalize from my own experience, we more often than not get up without any struggle or decision at all. We suddenly find that we have got up. A fortunate lapse of consciousness occurs; we forget both the warmth and the cold; we fall into some reverie concerned with the day's life, in the course of which the idea flashed across us, 'Hello! I must lie here no longer' – an idea which at that lucky instant awakens no contradictory or paralyzing suggestions, and consequently produces immediately its appropriate motor effects. (James, 1890, pp. 1132–1133)

As convincing as this example of the efficacy of the ideomotor principle may seem, it does not in fact concern a volitional act, but merely the point in time at which an unquestioned act (getting out of bed on a winter's day) is carried out. Nevertheless, the example points to the existence of something that may govern volitional processes, to a "metavolition," namely, triggering the execution of an intended action by activating a mental representation. James even presupposes

the existence of metamotivations when he postulates that the deliberative motivational process, i.e., the weighing up of two alternative courses of action, is controlled by two opposing tendencies:

1. The “impatience of the deliberative state”
2. The “dread of the irrevocable”

Beyond this, James identified five types of decisions that mark the point at which the motivational state ends and volition begins. He saw one type associated with the feeling of effort, when all avenues had been explored and considered and the balance was perceived as equal, but a decision had to be made. Because James, unlike his contemporaries in Germany, was not interested in determining the essence of volition, but rather in finding typical situations in which “will” could play a useful explanatory role, he explored all relevant areas of motivational research:

- Motivation
- Intention formation
- Volition

The study of volitional phenomena evidently remained purely descriptive for such a long time because it was difficult to imagine that manifestations of “higher” mental processes could be studied experimentally, in the same way as perception and memory.

2.3.3 Approaches to an Experimental Psychology of Volition

The late nineteenth and early twentieth century saw three separate approaches to the experimental study of volition. The first two concerned the conceptualization of two different courses of action within a theory of volition. One involved simple reaction-time experiments (Külpe, 1893; Lange, 1888); the second addressed processes of association when a specific task was imposed (Ach, 1905, 1910; Müller & Pilzecker, 1900). The third approach involved the experimental induction of a volitional act, with participants

having to choose between two possible implementations of an intention (Michotte & Prüm, 1910).

Reaction-Time Experiments Although not intended to address volition as such, many early endeavors in experimental psychology in the areas of perception, imagination, learning, and thought had a volitional character in terms of the task-centered activities of the respondent. Boring, in his *History of Experimental Psychology* (1929), lists 12 explanatory concepts developed by the psychologists of the era to account for the volitional nature of experimental tasks. These include:

- Attention
- Expectation
- Preparation
- Predisposition
- “Einstellung” (set)
- “Aufgabe” (instruction)
- Predetermined, determining tendency (along with G. E. Müller’s associative and perseverative tendencies)

In the last three decades of the nineteenth century, reaction-time experiments were very much en vogue. They were prompted by the discovery of the “personal equation,” i.e., individual differences in the timing of stellar transit across the reticle of a telescope. These differences between observers had raised concerns among astronomers, generated much research, and led to the development of new observational methods. It emerged that the original eye-and-ear method (ear to hear the ticking of a clock) involved a “complication,” i.e., a mental confounding of the two sensory systems. With this in mind, Donders (1862), a physiologist from the Netherlands, returned to the study of simple reactions and complicated these by the successive addition of other mental processes, e.g., by giving two stimuli, each of which required a different response. The lengthened reaction time observed in the two-stimulus condition relative to the single-stimulus condition was attributed to the additional mental process involved – in this case,

choice. This “subtractive” procedure led to large-scale studies of “mental chronometry” in Wundt’s laboratory. Notably, these procedures have regained currency in contemporary cognitive psychology, where they are used for the analysis of information processing.

In 1888, Ludwig Lange, one of Wundt’s students, ran the first experiment in volitional psychology, though without being aware of the fact. His respondents were instructed to attend either to a stimulus or to its motor response. It emerged that reaction times are shorter when attention is focused on the motor response than when it is directed to the stimulus. Wundt speculated that this difference between “muscular” and “sensory” response time arose because in the latter case the stimulus is not just perceived, but also apperceived (interpreted). The temporal difference in favor of the muscular reaction was thought to reflect the duration of the apperception process, namely, about 0.1 s. *Mental chronometry* based on Donders’ “subtractive procedures” sparked some controversy, however. Külpe (1893) joined in the fray shortly before moving to Würzburg. He aimed to demonstrate that each task imposed results in a corresponding predisposition that determines the focus of the respondent’s attention in Lange’s experiment, thereby initiating a different process. According to Külpe, the resultant process is an integrated one that is not analyzable in terms of isolated components that can simply be added or subtracted.

- Külpe’s explanation was thus in line with volitional theory, suggesting that a goal, once accepted by the respondent, governs task-related activities even in those areas that are not, or not directly, under volitional control.

The Würzburg School A similar conceptualization was apparent in the primary research endeavor of the Würzburg school, namely, the introspective analysis of thought processes. Here it was not only discovered that much of the thought process is beyond our conscious experience but also that the process must run an orderly course as the solution to the task set manifests itself directly (see the excursus below).

Excursus

Experimental Approaches to Thought Processes

Watt (1905), a member of the Würzburg school, made a remarkable discovery. His respondents were asked to form associations between nouns (e.g., “bird”) and superordinates (e.g., “animal”) or subordinates (e.g., “sparrow”). The subsequent introspection was then divided or “fractionated” into four time periods. Oddly enough, it was the third period, the search for the reaction word, that yielded least content, i.e., the least awareness. Watt concluded that the actual intent of an activity remains in awareness only so long as the respondent is taking the experimental instructions on board. After that, the impact of an intention on the cognitive process is unconscious and automatic. In his interpretation of the ideational process in association experiments, Georg Elias Müller (1850–1934) had already postulated a “perseverating tendency” in addition to purely associative tendencies. The adoption of a task results in a corresponding “Einstellung” (set).

Narziss Ach (1905, 1910), who began his research career in 1900 with G. E. Müller in Göttingen and moved to Würzburg in 1904, coined the term “determining tendency,” which was also adopted by Watt and other investigators of thought processes, e.g., Otto Selz (1913). It incorporated the concept of “perseverating tendency” introduced by Ach’s teacher G. E. Müller. Using reaction-time measures and “systematic experimental introspection” (subtly directed retrospection), Ach (1905) showed that determining tendencies below the level of conscious awareness must be at work in the implementation of an intended goal and that this holds for both mental and motor tasks.

Ach’s (1910) attempt to measure volitional strength also proved to be of great significance. In his ingenious experiment,

(continued)

the associative strength of pairs of syllables, which was varied by manipulating the frequency of presentation, was rivaled by a new instruction for a contrasting task (a different combination of syllables). This meant that a volitional tendency (to carry out the new instruction) competed with an established habit. A triumph of the determining tendency to execute the new task would mean that “associative equivalence” had been reached. In other words, the volitional strength would outweigh the previously established associative strength. The reaction times in this rivalry condition were longer, and there were occasional response errors. In some cases, these errors induced respondents to renew their intention to carry out the task imposed. Ach analyzed this post hoc renewal of the intention and proposed that the “primary volitional act” comprises four elements including a self-reference; e.g., “I really want to do it!”

Selz (1910) was quick to note that Ach had not investigated the original volitional act, but a post hoc renewal of the intention in the face of unsuccessful attempts at its implementation. Nevertheless, the characteristics identified by Ach do seem to provide insight into the components of an intention or determining tendency that direct action. Ach also discovered some volitional metaprocesses (to use modern terminology) using this method of introspection.

Narziss Ach was concerned only with volitional processes and paid no heed to motivational issues. There is no doubt that he pioneered the experimental study of volition. Unfortunately, however, this research program withered even within his lifetime. A major contributor to its demise was Kurt Lewin (1890–1947), a young member of the Gestalt school at Berlin, which was founded by Wolfgang Köhler (1887–1967) and Max Wertheimer (1880–1943). In his dissertation, Lewin replicated Ach’s attempt at measuring volitional strength, but changed the procedure

slightly to show that the mere associative coupling of pairs of syllables as a function of repeated presentation does not give rise to a reproduction tendency unless there is an independent determining tendency to reproduce.

The dispute between Ach and Lewin, which was continued in the works of some of Ach’s students, is extremely complex, soon lost its relevance to research, and remains unresolved to this day. A decisive factor in all of this was Lewin’s (1926) influential paper on “Intent, Volition, and Need,” in which he expanded productively on several aspects of Ach’s volitional act, such as the mental representation of an opportunity for action and the steps in its implementation. For Lewin, however, the psychological character of an intention consists in a “quasi need” that derives from “genuine needs.” With this, the defined goals of individual intentions became variably objectifiable and generalizable motivational goals (Heckhausen, 1987), and questions of volition became questions of motivation. Of course, these were already dominating the other approaches in motivational research.

That did not keep Lewin and his students from developing a number of experimental paradigms for a psychology of action and emotion. These paradigms were more suited to the study of volitional questions than to motivational issues, and their utility in this respect has by no means been exhausted. They include:

- The retention and resumption of interrupted tasks (Ovsiankina, 1928; Zeigarnik, 1927)
- The discharge value of completing a substitute activity (Lissner, 1933; Mahler, 1933)
- The forgetting of intentions (Birenbaum, 1930)

The Leuven School This final approach to the experimental investigation of volition was founded by a Belgian, Albert Michotte. In 1905, and again in 1906, Michotte spent a semester with Wundt in Leipzig. In the 2 years following the 1906 meeting of the German Psychological Society in Würzburg, he spent several months at Külpe’s institute, where he was introduced to

Ach's work and indeed to the whole of contemporary German thought, which came as a "revelation" to him (Michotte, 1954). In 1908, Michotte and E. Prüm had concluded a lengthy experimental study on volitional choices ("choix volontaire"), the results of which were not published until 1910 because they first had to be translated from German (Prüm's mother tongue) into French. This meant that the Michotte and Prüm monograph appeared – coincidentally and entirely independently – in the same year (1910) as Ach's analysis of the volitional act. In contrast to Ach's post hoc analysis, the Belgian studies succeeded in analyzing the volitional act while it was happening. Admittedly, the actual intention – to follow the experimenter's instructions – had again been formed much earlier. However, there was still a choice to be made between two possible means of implementing each task, as quickly as possible and based on "serious motives."

Once the decision was made, and without waiting for its implementation, there was detailed introspection on the 4–5 s in which the choice had been made. The authors found a certain regularity in the sequence of processes:

- A motivation to weigh up the alternatives
- An inhibition or pause prior to the decision
- A resolution of the expectancy and muscle tensions once the decision had replaced doubt by certainty and, above all, by a conscious awareness of the action planned

The authors viewed the latter as the defining characteristic of a volitional act.

Unfortunately, Michotte did not continue his studies on volition (see his overview of 1912); his later research focused on the study of *phenomenal causality*. The tradition of Michotte's and Ach's volitional psychology was continued in England by F. Aveling (1875–1941), who began his research career at Michotte's laboratory. Evidently the only scholar to work in the field of volition outside continental Europe, Aveling (1926) continued the introspective analysis of volitional acts. For him, a crucial feature was in the identification of the self with the motives for

the preferred action alternative. For the most part, his work substantiated the findings of Ach and Michotte.

In the USA, volitional issues surfaced only periodically after their phenomenological heyday in the writings of William James. Even then, they emerged in behavioristic contexts in works such as Irwin's (1971) *Intentional Behavior and Motivation – A Cognitive Theory*. Here, Irwin gives a stringent explanation of how an observer, with knowledge about a situation, an act, and its outcome, is able to predict the choice of an act and hence to infer the intention of the actor. In an essay entitled "From Acts to Dispositions," Jones and Davis (1965) proceeded in an analogous manner, analyzing the mental logic used by an observer of specific acts to infer not intentions, but personality dispositions, i.e., to attribute motives to the actor (Chap. 14).

In Germany, Johannes Lindworsky (1875–1939) collated the findings of volitional research (1923, 3rd ed.). Based on his own observations and on a reanalysis of Ach's findings, he, like Selz (1910), doubted that the intensity of a volitional act could enhance the implementation of an intention. Instead, he suggested that what is crucial is keeping the imposed task in mind while it is being executed and not "squeezing out" a forced intention (Lindworsky, 1923, p. 94).

Three other students of Ach deserved to be mentioned here: Hillgruber, Düker, and Mierke. Hillgruber (1912) discovered what he called the "difficulty principle of motivation," which relates to the implementation of volition during the execution of a task. He found that increasing the difficulty level of a task (in terms of the speed of presentation of syllables to be reversed) increased the number of correct responses. Hillgruber attributed these findings to greater volitional tension. Düker (1931, 1975) reported similar findings, which he held to reflect a "reactive increase in tension."

Locke's more recent goal-seeking theory (1968; Locke & Latham, 1990) also relates to these volitional issues. According to this theory, it is only an apparent paradox that higher goal setting leads to improved performance. Finally,

in 1955, Mierke published a book with the term “will” in the title *Wille und Leistung* or *Will and Performance*.

That was to be the last usage of the term for some time to come. Times have changed once more, however (Chaps. 11 and 12), and the terms “will” and “volition” are now acceptable again. Kuhl (1983) found individual differences in the ability to protect an intention that is being implemented against competing intentions or against a subsequent preoccupation with an unsuccessful outcome. He subsumed the processes involved under the term “action control.” This signaled a return of the “determining tendency,” if not of the volitional act itself, to psychological research. The Würzburg school’s work on volition has also made a comeback. It covers aspects such as:

- The “volitional act”
- The formation of an intention
- The transition from the motivational to the volitional phase
- The initiation of the intended action

2.4 The Instinct Theory Approach

William James adopted the term instinct as an explanatory concept, but limited it to a particular class of behaviors, which he differentiated from behaviors such as emotion, habit formation, and volitional acts. He defined instinct as follows:

Definition

the faculty of acting in such a way as to produce certain ends, without foresight of the ends, and without previous education in the performance. (James, 1890, Vol. II, p. 383)

He emphasized the stimulus conditions, which, owing to built-in neural structures within the organism, trigger an automated behavioral sequence that is not learned or based on a goal expectation. This compulsive, automatic response to particular situational conditions is vividly

described in James’s famous description of a broody hen:

To the broody hen the notion would probably seem monstrous that there should be a creature in the world to whom a nestful of eggs was not the utterly fascinating and precious and never-to-be-too-much-sat-upon object which it is to her. (James, 1890, Vol. II, p. 387)

In contrast to James, Wundt’s view of instinct remained largely unaffected by Darwin. Wundt (1896) closely linked instinct with drive and drive with goal-directed behavior. For him, instinctive behaviors derived from previously volitional behaviors that had, at some point, become mechanized.

2.4.1 The Pioneer of Instinct Theory

It was, however, the Anglo-American William McDougall (1871–1938) who pioneered the instinct theory approach within the study of motivation. At the start of his career, he was influenced by European psychology, with its introspective analyses of volitional phenomena, as well as by the Darwinian revolution, with its focus on the heredity of behavioral characteristics. His assessment of the relative merits of each approach laid the foundations for Anglo-American motivation research in the twentieth century. In his influential work, *Introduction to Social Psychology* (1908), which, despite its title, addressed the psychology of motivation, and of which there were more than 30 editions, he argued against the European volitional perspective and in favor of an approach based on instinct theory. This cleared the path for the study of motivation and blocked off the volitional route. In the introduction to his 1908 book he wrote:

I will merely sum up on the issue of the work of the nineteenth century as follows: – During the last century most of the workers in the social sciences were in two parties – those on the one hand who with the utilitarians reduced all motives to the search for pleasure and the avoidance of pain, and those on the other hand who, recoiling from the hedonistic doctrine, sought the mainspring of conduct in some vaguely conceived intuitive faculty, instinct, or sense. Before the close of the century

the doctrines of both of these parties were generally seen to be fallacious; but no satisfactory substitute for them was generally accepted, and by the majority of psychologists nothing better was offered to fill the gap than a mere word, “the will,” or some such phrase as “the tendency of ideas of self realization.” On the other hand, Darwin, in the *Descent of Man* (1871) first enunciated the true doctrine of human motives, and showed how we must proceed, relying chiefly upon the comparative and natural history method, if we would arrive at a fuller understanding of them. (McDougall, 1908, p. 14)

McDougall did not completely ignore volition, however. In fact, he devoted an entire chapter to it. He maintained that humans are not mere victims of hedonism, as Darwinian theory dictates, but that they experience conflicts of motives. In his debates with Wundt and James, McDougall rejected the notion of the inhibition of one of two competing motives as the principle underlying volitional decision-making. Instead, he proposed that one of the motives is strengthened or reinforced by an impulse deriving from the motive system or the “system of self-regarding sentiment.” Applied to the problem of decision-making, he defined volition as follows.

Definition

as the supporting or re-enforcing of a desire or connotation by the cooperation of an impulse excited within the system of the self-regarding sentiment. (McDougall, 1908, p. 249)

In attributing decision-making to a self-regarding motive, McDougall’s perspective was consistent with one of the central notions of the volitional psychology of Ach and Michotte, namely, the ego- or self-involvement of the process. This was and remained the only point of contact between the two approaches, however. The manifold psychologies of the “self” that have since developed and come to play an important role tend to be seen in terms of motivational and not volitional processes.

McDougall remained fundamentally dissatisfied with the era’s introspective studies of consciousness. He wanted to investigate what people actually do, based on sound phylogenetic

principles that for him were the instincts, which he defined as follows.

Definition

An inherited or innate psycho-physical disposition which determines its possessor to perceive, and to pay attention to, objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner or, at least, to experience an impulse to such action. (McDougall, 1908, p. 25)

To break down this rather complex explanatory construct:

- Instincts are innate.
- They have an energizing and piloting function.
- They consist of an ordered sequence of predispositional processes of perceptual processing (cognitive).
- Emotional arousal (affective).
- A readiness to act (conative).

McDougall began by compiling a list of 12 instincts, which he later expanded (see also Chap. 3). He no longer called them “instincts,” but “propensities,” the defining components of which were less fixed. He thus avoided giving the impression that they are simply highly stereotypical sequences of behavior. What remained was essentially a goal-directed behavioral tendency.

Definition

A propensity is a disposition, a functional unit of the mind’s total organization, and it is one which, when it is excited, generates an active tendency, a striving, an impulse or drive towards some goal. (McDougall, 1932, p. 118)

The Instinct Controversy This work had been preceded by the so-called instinct controversy of the 1920s, one of the few great public

controversies in psychology. McDougall's main opponent was J. B. Watson who, as early as 1913, proposed that psychological research should be restricted to phenomena that are objectively observable and can be intersubjectively validated. McDougall's instinct theory had led many psychologists to explain all kinds of behavior in terms of particular instincts. In 1924, Bernard searched the literature for hypothesized "instincts" and found no less than 14,046! It goes without saying that this expansion of the concept turned it into a circuitous construct with very little explanatory value. McDougall had resisted such expansions – his final list encompassed no more than 18 "propensities" (1932). After a few years, the public lost interest in the instinct controversy, without any clear verdict having been reached (cf. Krantz & Allan, 1967).

Summary

McDougall strongly influenced two other important approaches to the study of motivation:

- First, the strand of research based on personality theories. His lists of instincts or propensities played a key role in endowing personality with motive-like dispositional variables. This was especially apparent in the trait theories of Allport (1937), Philipp Lersch (1938) in Germany, and in H. A. Murray's (1938) formulations, which significantly influenced the development of an approach in motivational research based on personality theory.
- Second, McDougall's work was the direct precursor of a strand of research that focused on the analysis of instinctive behavior and eventually evolved into the study of comparative behavior or ethology.

2.4.2 Forerunners of Ethology

The credit for instigating the study of comparative behavior goes to Konrad Lorenz (1937, 1943), who criticized McDougall's instinct theory for its vague definitions, and instead defined instinctive behavior as limited to a hereditary response sequence, i.e., to the invariant links in a chain of goal-directed behaviors that culminate in a terminal response.

This final link, which manifests the actual instinctive behavior, is driven solely by the central nervous system. Triggered by an *innate releaser mechanism*, it is not flexible or modifiable in any way. The antecedent links are still oriented toward the situational context. The earlier they occur in the chain, the more likely they are to be modifiable through learning. This applies particularly to the preliminary phase of "general activation."

Example

Certain instinctive behaviors (such as the following response in ducklings and goslings) can become imprinted to arbitrary objects if the organism is exposed to these during a short critical period early in its ontogenetic development.

Intensive research efforts were focused on identifying the key stimuli that elicit a certain instinctive behavior in a given species. If these key stimuli are absent over a long period of time, the instinctive behavior may begin without external releasers, in what is known as "idling behavior."

The example of a duckling's following response illustrates two aspects of instinctive behavior:

- First, that it is highly stereotyped and not dependent on experience
- Second, that the releaser mechanisms involve internal processes that are subject to critical periods of readiness

The latter observation led Lorenz (1950) to postulate a kind of "psychohydraulic" model of motivation that resembled Freud's (1895) early conceptualizations. Lorenz assumed that each instinct is powered by an action-specific energy, which is regenerated on an ongoing basis and stored in a reservoir. If the instinctive behavior has not occurred for some time, the reservoir overflows, i.e., the behavior is produced in the absence of the external stimuli (idling behavior).

Nikolaas Tinbergen (like Lorenz, winner of the 1973 Nobel Prize for Medicine), who system-

Definition

I will tentatively define an instinct as an hierarchically organized nervous mechanism which is susceptible to certain priming, releasing and directing impulses of internal as well as of external origin, and which responds to these impulses by coordinated movements that contribute to the maintenance of the individual and the species. (Tinbergen, 1951, p. 112)

atically extended Lorenz's approach, defined instinct in the following terms.

In this definition, a "nervous mechanism" is contrasted with an "impulse" that functions to activate the instinct, i.e., to motivate the behavior.

Although contemporary ethology is beyond the scope of the psychology of motivation, it has again gained increasing attention among motivation researchers, owing to two factors in particular:

1. Its criticism of learning theorists' laboratory experiments, in which animals are placed in artificial environments, rather than in natural ecological ones
2. Its attempts to apply various ethological findings to human behavior (Eibl-Eibesfeldt, 1973, 1984)

Lorenz's (1966) attempt to apply an instinct-theoretical conceptualization of aggression to humans encountered most criticism from motivation psychologists. Based on his psychohydraulic model of instinct energy, Lorenz postulated that a kind of aggressive energy is constantly being produced within an organism. This energy can build up to dangerous levels unless given occasional opportunities to dissipate in the form of harmless substitute activities.

A more detailed description of instinct theories in ethology can be found in Cofer and Appley (1964), Eibl-Eibesfeldt (1975), Hess (1962), and Hinde (1974). Boyce (1976) presents a critical assessment of Darwin's influence on ethological research under natural conditions and of laboratory research on animals.

Contemporary ethology attempts to explain the relationships between observed situational and behavioral variables by means of neurophysiological constructs or models – in part, with theoretically neutral characteristics in terms of systems theory.

2.5 Personality Oriented Approach

This tradition of motivation research addresses the issues solely from the perspective of human psychology. Motivation tends to be seen either as a key domain within which to describe and gain a deeper understanding of personality as such or as a source for explaining differences between individuals. Yet it can also be seen as a process that can explain actual behavior in terms of individual differences. This is the approach characteristic of motivational psychology as well as cognitive psychology.

The Father of Psychoanalysis Freud (1856–1939) has already been identified as the pioneer of this approach. He was concerned with explaining apparently unfathomable behaviors by means of clinical observation and procedures designed to elicit and interpret unusual thought processes. Freud was convinced that hidden, unconscious processes guide behavior and influence conscious thought. He considered psychodynamic conflicts to be reflected in unconscious drives and assumed the fragmentary and indirect manifestation of these drives in behavior and conscious experience to be the key to understanding behavior (see the excursus on p. 21).

Freud was committed to Darwin's biological-empirical determinism which he saw confirmed by the success of medical science at the time. He rejected the popular notion that mental processes could be investigated by the introspective analysis of mental content. For him the task was to identify in humans the vital biological drive dynamics that underlie manifest behaviors in all organisms. These he saw as the actual psychological processes operating in a continuous cause-and-effect relationship that, to him, was the unconscious. Examination of the stream of

consciousness reveals that unconscious processes are not the exception to the rule, but that the reverse is true. Conscious mental contents are fragmentary derivatives of the continuous activity of the unconscious. For Freud, all this was the result not of passive reactions to external impressions, but of an active orienting within the organism, its forces and conflicts. If he was influenced by any contemporary school of psychology, it was that of Brentano, whose lectures he had attended in Vienna and who, in contrast to Wundt, saw mental “acts” as characterized by directed intentionality. Incidentally, this was also a position increasingly espoused by the Würzburg school, resulting in controversy between that group and Wundt.

Excursus

Freud applied his analysis of hysteria and other neuroses in many ways, not only to identify the effects of unconscious processes but also to tap into them directly, to “bring them into consciousness.” At first he used hypnosis, later the interpretation of dreams (1900/1952) and free association. Most of all, however, he engaged in ingenious means-end speculations. Like the behavioral psychologists, Freud attempted to identify relationships between antecedent conditions and subsequent manifestations by postulating various hypothetical mediating processes as explanatory concepts (a task that Freud approached with great flexibility and remarkable openness to continuous self-correction). It was not until 1915 that Freud formulated a comprehensive theory of motivation in his monograph *Instincts and their Vicissitudes*, although the roots of this work can be found in *Project for a Scientific Psychology*, published in 1895. According to Freud, what the “psychic apparatus” has to contend with are not external, but internal stimuli. Unlike external stimuli, the latter cannot be avoided, because they arise

within the organism itself. The organism has manifold needs that result in continuous production and accumulation of drive stimuli, and this accumulated potential has to be discharged on an ongoing basis.

The nervous system is an apparatus which has the function of getting rid of the stimuli that reach it, or of reducing them to the lowest possible level; or which, if it were feasible, would maintain itself in an altogether unstimulated condition. (Freud, 1952c, p. 213)

The Drive Reduction Model Freud’s theory of motivation represents a drive reduction model. It has much in common with the conceptual model of ethology outlined above and, as we will see below, forms the basis for the learning branch of the associationist approach to the study of motivation. The drive reduction model incorporates homeostatic and hedonistic ideas. The lower the accumulated drive stimulus level, the closer the organism comes to equilibrium. Reductions are accompanied by pleasurable sensations, while increases bring about displeasure. Thus, the activity of the psychic apparatus becomes subject to the pleasure-displeasure principle.

Drive, for Freud, is an instance of mind-body dualism, combining the organismic (i.e., energy) with the psychological (i.e., affect) in the form of a mental representation. Furthermore, he differentiates four aspects in every manifestation of a drive.

If we now apply ourselves to considering mental life from a biological point of view, an “instinct” appears to us as a concept on the frontier between the mental and the somatic, as the psychical representative of the stimuli originating from within the organism and reaching the mind, as a measure of the demand made upon the mind for work in consequence of its connection with the body.

We are now in a position to discuss certain terms which are used in reference to the concept of an instinct – for example, its “pressure,” its “aim,” its “object” and its “source.”

By the “pressure” (Drang) of an instinct we understand its motor factor, the amount of force or the

measure of the demand for work which it represents

The “aim” (Ziel) of an instinct is in every instance satisfaction, which can only be obtained by removing the state of stimulation at the source of the instinct

The “object” (Objekt) of an instinct is the thing in regard to which or through which the instinct is able to achieve its aim. It is the most variable part of an instinct and is not originally connected to it, but becomes assigned to it only in consequence of being peculiarly fitted to make satisfaction possible

By the “source” (Quelle) of an instinct is meant the somatic process which occurs in an organ or part of the body and whose stimulus is represented in mental life by an instinct. (Freud, 1952c, pp. 214–215)

Freud viewed mental life as a process of dynamic conflict. In this regard, he was influenced by dualistic principles – an influence that is also reflected in his attempts to solve the problem of classifying motives. He did not attempt to evolve an exhaustive catalog of motives, but kept a decision pending. In 1915, he contrasted ego- or self-preservation drives (e.g., the need for nourishment) with the sexual drives (libido). Later, influenced by World War I, he replaced the former by aggression drives. Nevertheless, his main research interest remained the sexual drives, which he conceptualized in a very broad sense. In his final works he postulated an antagonism between life instincts (“Eros”) and death instincts (“Thanatos”).

Other major aspects of Freud’s drive theory that have influenced more recent work on motivation include the following:

1. Drive impulses become manifest in different ways. If there is high drive intensity without an appropriate object for its satisfaction, the unfulfilled desires continue to take effect by manifesting themselves in consciousness in the form of mental images of earlier drive satisfactions. This notion later had a determining influence on the development of procedures for the assessment of motives (Murray, 1938; McClelland, Atkinson, Clark, & Lowell, 1953). Drive impulses can also be diverted to other objects; they can be sublimated (i.e., directed to nonsexual goals) or suppressed. In the later case, they can influence experience

(e.g., in dreams) or behavior (e.g., slips of the tongue or neurotic behavior) in ways that are difficult to decipher.

2. Freud views mental life as a constant conflict between contradictory tendencies within the individual. He proposes a three-level structure of the psyche, in which the pleasure-seeking “id” is subject to the moral control of the “superego,” and the reality-oriented “ego” seeks to mediate between the two.
3. The adult personality is an outcome of drives and their vicissitudes in childhood. Interference in drive development, particularly in early childhood, can have very negative effects on an individual’s “capacity to work and love.” Psychoanalytic therapies make it possible to access the causes of these developmental disturbances and to “rework” them.
4. Drives develop through a number of psychosexual stages, sequentially focused on specific erogenous zones (areas around various body cavities that are sensitive to pleasure) that dominate the pleasure seeking of that stage and provide for its satisfaction. The order is as follows:
 - The mouth (oral phase: sucking, swallowing, biting)
 - The anus (anal phase: excretion)
 - The genitals (phallic and genital phase: masturbation, homosexual, and heterosexual relations)

Drive development can become fixated at any stage. Confronted with traumatic events, it may also revert to an earlier stage (regression).

5. Drive development evolves from a three-person drama involving a married couple and an outsider. The child is cast in the latter role, wanting to become sexually involved with the opposite-sex parent and feeling threatened by the same-sex parent (Oedipus complex). Normally, this conflict is resolved through identification with the parent of the same sex. Thus, even in early childhood there is internalization of moral norms (represented in the parent of the same sex) leading to the formation of

conscience (superego) as a controlling authority within the personality structure.

The three last points – the significance of early childhood experiences, the vicissitudes of drive development, and the socializing effects of interactions between family members – continue to influence both theory and research on personality development and the genesis of motives. Since Freud, the descriptive analysis of static components has been supplemented by a dynamic-emotive approach covering processes of development. This approach has affected the study of motivation in many ways. Rapaport (1959, 1960) provides a detailed assessment of its contributions. Toman (1960) expanded the psychoanalytic theory of motivation, focusing on the periodicity and the developmental and biographical aspects of motivational phenomena.

Of course, psychoanalysis was not the only theory of personality at the beginning of the last century. Within “academic psychology,” as psychoanalysts called it, there was, for example, Ach’s (1910) rather premature identification of personality types, based on the individual differences he observed in his experiments on volition.

Kurt Lewin’s Field Theory A far more productive and influential personality theorist was Kurt Lewin (1890–1947), who focused not on individual differences but on broader psychological principles. Lewin began his critical evaluation of Ach’s analysis of volition in his dissertation. In 1926, he replaced Ach’s term “determining tendencies” with the term “quasi needs” (see the excursus below) – ostensibly without altering the concept being designated. In retrospect, however, it is clear that the change of terminology was associated with a change in conceptualization. The volitional process, as defined by “determining tendencies,” became an issue in motivation. More specifically, the distinction between motivational and volitional concepts disappeared from view once more and remained obscured until research on volitional issues resurfaced in the 1980s.

Excursus

The Principles of Lewin’s Field Theory

Lewin attempted to explain behavior solely in terms of the (momentarily) existing field of psychological forces. In his “field theory,” these psychological forces are cast as vectors (Chap. 5) that emanate from objects and regions of the environment having demand character (valence). These forces affect the individual and determine his or her actions. Lewin attempted to describe the field-theory aspects of his model by means of a topological (later “hodological”) analog. Independent of his field theory model of the environment, he had earlier developed a person-oriented model of motivation in terms of an accumulation of single, central, or more peripheral regions (at surface or lower levels). Each region represents a need or quasi need. Depending on the need condition, each region is a system under more or less tension, striving for release via the executive functions (e.g., motor activities), and using such means as resuming an unfinished task. Dynamic conceptions of this kind are not very far removed from Freud’s ideas.

For both Freud and Lewin, the reestablishment of equilibrium is the major principle of motivation. Lewin explains behavior as a function of the person and his or her (perceived) environment, as reflected in his general equation for behavior: $B = f(P, E)$.

Lewin and his students carried out numerous studies on the psychology of action and emotion. Some of his experimental paradigms have become standard procedures for motivational research. This applies particularly to methods of determining and analyzing levels of aspiration (Hoppe, 1930; Jucknat, 1938). Some of the phenomena Lewin investigated by experimental means, such as the substitute value of alternative

action for an unfinished task, show an affinity to Freud's theories. Freud's influence on Lewin was probably greater than reflected in the latter's writings, which are critical of Freud's explanations of present behavior in terms of past events in the individual biography. Lewin (1931) was perhaps the first to propose an interaction between the person and the situation. Nevertheless, his research was focused far more on the effects of situational differences than on individual differences.

Lewin endeavored to conceptualize an existing psychological "total situation" (called the "life space") that incorporated both the person and the subjectively perceived environment in a unified (field theoretical) model. This model represents a momentary interplay of forces, portrayed in terms of a general dynamic. The interplay of forces results in behavior analogous to the sum of the vectors. However, these sophisticated theoretical concepts stood in stark contrast to the lack of techniques available for measuring constructs, such as tension, forces, directions, valences, regions, and distances, or for linking them to observable data.

This is undoubtedly why Lewin's (1936, 1963) field-theory model did not have a great deal of influence on later research. Nevertheless, his thoughtful construction of concepts (e.g., demand character) and functional relationships, his analysis of situational forces (that formed the basis for conflict typologies), and above all his experimental paradigms for inducing motivational phenomena (e.g., level of aspiration) had a significant influence on later motivational research.

Lewin's contribution to research entails a branching of the lines of influence. Lewin indirectly influenced the psychology of learning via Tolman and the personality psychology approach to motivational research via Allport, as we will see later. He directly influenced the motivation psychology branch within personality theories of motivation through Henry A. Murray in the 1930s, J. W. Atkinson in the 1950s, and V. H. Vroom in the 1960s.

2.5.1 The Motivation Psychology Approach

2.5.1.1 Instrumentality Theory

Vroom's contribution – although relatively recent – was directly influenced by both Lewin and Tolman. At the beginning of the 1960s, industrial psychology had accumulated a wealth of findings on matters such as job satisfaction and job performance. Vroom (1964) developed what became known as instrumentality theory to shed more light on these findings. It is based on the idea that actions and their outcomes tend to have a series of consequences with differing levels of positive or negative valences for the individual. The individual anticipates these consequences, and this anticipation serves to motivate action. In other words, an action is guided by the instrumentality it has for the occurrence of desirable consequences and the nonoccurrence of undesirable ones.

Significantly, however, this simple idea has had little impact on laboratory research on motivation to date. The actions of participants in laboratory experiments are, after all, of little consequence to them (aside from helping the experimenter or contributing to "science," meeting a course requirement, or making a small amount of money). In real-life settings, such as the workplace, much depends on one's actions and their outcomes.

According to instrumentality theory, the individual valences (Lewin's demand characters) of the subjectively perceived consequences of one's actions must first be identified and then multiplied by the action's "instrumentality."

Definition

Instrumentality is the level of expectancy that an action will either produce or preclude certain consequences.

In the latter case, the instrumentality is negative. The sum of the products of valences and instrumentalities for each consequence gives the

instrumentality-weighted total valence of a possible action outcome, which – provided that the subjective probability of successfully attaining the goal is high enough – will then motivate behavior. Vroom’s instrumentality theory is therefore a more precise formulation of the expectancy-value model originally conceptualized by Lewin and Tolman (Lewin, Dembo, Festinger, & Sears, 1944; Tolman, 1932; see also Chap. 5).

2.5.1.2 Murray’s Research Approach

Murray was a key figure in the motivation psychology branch within personality theories of motivation, having been influenced by Darwin, McDougall, and primarily by Freud. In his book *Explorations in Personality* (1938), Murray gave a precise definition of the term “need” that had much in common with psychoanalytic thinking. He distinguished and delineated some 35 different needs (see Chap. 5), determined the situational incentives associated with each (“press”), drew up a detailed taxonomy of behaviors relevant to motivation, compiled questionnaires (or rating scales) to assess individual differences in motives, and – together with 27 collaborators – administered these questionnaires, interviews, clinical tests, experimental procedures (level of aspiration), etc., to various samples. In so doing, Murray laid the foundations for a breakthrough by McClelland and Atkinson in the early 1950s that consisted in:

- The more precise definition of one specific motive, the achievement motive
- The development and validation of a method to assess individual differences on the basis of Murray’s thematic apperception test (TAT)

The opportunity to assess individual differences in motives before the event sparked intensive research efforts addressing fundamental issues in motivation research and prompted the development of techniques to measure other motives, such as social affiliation and power (Chaps. 7 and 8).

2.5.1.3 McClelland’s Theoretical Assumptions

McClelland was a student of the learning theorist Hull. This academic lineage played a decisive role in the further articulation of what was still a rather global definition of “need” within the personality theory approach to motivation research. Lewin had conceptualized need as a momentary force (or a system under tension within the individual), without paying much attention to its evolution or dispositional character. For Murray needs were more enduring and idiosyncratic entities (analogous to the concept of motive). Although McClelland’s theory did not distinguish clearly between motive and motivation – that was accomplished later by Atkinson (1957, 1964) – it came very close to doing so. McClelland combined elements of associationism with aspects of anticipatory behavior and hedonistic theory. His proximity to Hull is reflected in his 1951 definition:

A motive becomes a strong affective association, characterized by an anticipatory goal reaction and based on past association of certain cues with pleasure and pain. (McClelland, 1951, p. 466)

Two years later (McClelland et al., 1953), he added a fourth component, namely, the discrepancy model of adaptation-level theory (Helson, 1948), which he borrowed from the psychology of perception and which he saw as the psychophysical foundation for the acquisition of all motives in the course of a lifetime. The basic idea is that there are (psychophysically prestabilized, unlearned) adaptation levels for different classes of stimuli or situational conditions, i.e., levels at which the stimuli are perceived as “normal” and neutral. Discrepancies from the adaptation level are experienced as positive, provided that they do not exceed a certain level. Beyond that level, they become increasingly unpleasant. Situational cues and antecedent conditions that are associated with these affective states and affective changes during ontogenetic development become capable of eliciting certain aspects of the original affective situation.

Definition

For McClelland, motivation is the “reintegration” by certain stimulus cues of an experienced change in an affective situation.

This definition is rather complex, as it attempts to explain with a single concept three issues pertaining to motives and motivation:

- The genesis of a motive
- Motive as an acquired individual disposition
- The eliciting stimuli as the actual motivation

McClelland et al. (1953) summarized all these as follows:

Our definition of a motive is this: A motive is the reintegration by a cue of a change in an affective situation. The word “reintegration” in this definition is meant to imply previous learning. In our system all motives are learned. The basic idea is simply this: Certain stimuli or situations involving discrepancies between expectations (adaptation level) and perception are sources of primary, unlearned affect, either positive or negative in nature. Cues which are paired with these affective states, changes in these affective states, and the conditions producing them become capable of re-integrating a state (A') derived from the original affective situation (A), but not identical with it. (McClelland et al., 1953, p. 28)

With its multipurpose character and fusing of several postulates, this definition was evidently too cumbersome to have a significant influence on the later motivational research spearheaded by McClelland’s former collaborator J. W. Atkinson. The discrepancy postulate, in particular, proved unsuccessful, although there were some initial attempts to develop this approach further (cf. Heckhausen, 1963; Peak, 1955). It is only recently that this postulate has begun to gain increasing significance, particularly in relation to the concept of “self-reinforcement,” which is a function of the discrepancy between an action outcome and a performance standard accepted as binding by the individual.

In contrast to Atkinson, McClelland was more interested in individual differences in motives, their genesis, and their consequences than in the motivational phenomena of actual situations. This blending

of motivational concepts with personality psychology is reflected in McClelland’s well-known analyses of historical change in the motivational climate of nations and his findings of a pattern of relations between motivational change and economic and political developments (1961, 1971, 1975).

McClelland determined national and historical indices of motivation based on the content analyses of literary documents, analyzed motivational aspects the entrepreneur personality, and worked on programs for the modification of motives (cf. McClelland, 1965, 1978; McClelland & Winter, 1969).

2.5.1.4 Atkinson’s Approach

Atkinson (1957, 1964) developed a formal model of motivation – the “risk-taking model” – which, more than any other, stimulated and influenced work on motivation in the 1960s and 1970s (see the excursus below and Chaps. 5 and 8). On the one hand, it elucidated the expectancy component of McClelland’s postulates by defining it in terms of the subjective probability of success, i.e., goal attainment (P_s). On the other hand, it related this component to the incentive for success (I_s) by means of multiplication. This product $P_s \times I_s$ builds on an approach previously developed by Lewin’s students Sybille Escalona (1940) and Leon Festinger (1942) to explain levels of aspiration, namely, the theory of resulting value. It represents a concretization of “expectancy-value theories,” which had emerged concurrently but independently as “decision theories,” formulated to predict consumer’s purchasing decisions in an economic context (von Neumann & Morgenstern, 1944) and bets placed in games of chance in a psychological context (cf. Edwards, 1954).

In decision theory, the product of expectancy and value is the subjectively expected maximum utility of success, which is assumed to govern the decisions of rational individuals. But do all individuals make rational decisions?

Excursus*The Risk-Taking Model*

Atkinson (1957) made a considerable step forward by taking account of individ-

(continued)

ual differences in motivation. He added a third, dispositional variable to the product of the probability of success and the incentive for success, namely, the motive to achieve success (M_s). This produced the “Atkinson formula” of the risk-taking model (see also Atkinson & Feather, 1966), according to which the current tendency to approach success (T_s) can be predicted if the actor’s motive to achieve success, the probability of achieving success under the pre-vailing conditions, and the incentive value of success are known:

$$[T_s = M_s \times P_s \times I_s]$$

This equation incorporates one of Lewin’s ideas, namely, that the demand character (or valence) is a product of motive and goal incentive.

An analogous equation was formulated for the tendency to avoid failure:

Motive to avoid failure \times probability of failure \times incentive of failure. This avoidance tendency is subtracted from the approach tendency to give the resultant tendency to perform.

Owing to its emphasis on individual differences in motives, the risk-taking model stimulated a wealth of research, producing many and diverse findings over a long period of time (see Heckhausen, Schmalt, & Schneider, 1985). This research will be examined in more detail in Chaps. 5 and 6.

Atkinson later turned to the study of changes in and resumption of an action. One of the questions he addressed harked back to Freud, namely, the aftereffects of unfulfilled motivations when an action is resumed. Atkinson incorporated these motivational remainders in his risk-taking formula as “inertial tendency” (Atkinson & Cartwright, 1964).

A book coauthored with D. Birch (1970, see also Atkinson & Birch, 1978) reflected a shift in Atkinson’s research interest, away from the motivational analysis of individual, “episodic” seg-

ments of action to the question of why a particular action tendency ceases to influence behavior while another commences to do so. His research focus shifted to what might be called the links in the continuous stream of activity. Atkinson’s dynamic theory of action is highly abstract; in fact, it postulates so many forces and dependency functions that computer programs are needed to determine the correct predictions for given starting conditions.

Together with J. Raynor – who had previously (1969) expanded the risk-taking model to account for future-oriented actions – Atkinson (1974a, b) attempted to explain the relationships between strength of motive, incentive level of the situation, and (cumulative) short-term and long-term achievement outcomes. This he did on the basis of an explanatory model formulated within the psychology of activation, the Yerkes-Dodson rule.

The Yerkes-Dodson rule states that an intermediate level of activity is most conducive to performance on a task of a given difficulty level.

2.5.1.5 Heckhausen’s Research on Achievement Motivation

At the Ruhr-University in Bochum, Germany, Heinz Heckhausen soon picked up on and expanded the work of McClelland and Atkinson. He developed and validated two independent TAT measures to assess the motive to achieve success and the motive to avoid failure. Together with his colleagues at the University of Bochum, Heckhausen explored various issues relating to the achievement motive:

- Development of motives (Heckhausen, 1972, 1982; Trudewind, 1975)
- Risk-taking (Schneider, 1973)
- Occupational choices (Kleinbeck, 1975)
- Level of aspiration as a personality parameter (Kuhl, 1978a, 1978b)
- Measurement of motives (Schmalt, 1976)
- Regulation of effort (Halisch & Heckhausen, 1977)
- Modification of motives (Krug, 1976)
- Applications in educational research (Rheinberg, 1980)

The Bochum group had also shown an early interest in attribution theory within cognitive

psychology (see below) – particularly in Weiner’s approach (1972) – and its members had contributed to the integration of the two research traditions. Their findings relate to aspects such as the perception of one’s own ability as a determinant of the subjective probability of success (Meyer, 1973, 1976), the motive dependency of causal explanations of success and failure, and the dependency of the affective consequences of an action’s outcome and change in expectancy on causal explanations (Meyer; Schmalz, 1979). Motive-related biases of causal explanations of success or failure proved to be important determinants of self-evaluation, suggesting that the achievement motive could be conceptualized as a self-reinforcement system (Heckhausen, 1972, 1978).

These multifaceted approaches led to the construction of more complex models of motivational processes. One such model was designed to predict expended effort on the basis of the perceived relationship between one’s own ability and the difficulty of the task (Meyer, 1973). This approach resembles Ach’s (1910) “law of difficulty of motivation.” Another such model is the “expanded motivation model” (Heckhausen, 1977a), incorporating elements of attribution theory and, above all, the various consequences arising from the outcome of an action and its incentive values. These effects had been previously neglected in achievement motivation research, but had gained currency in the psychology of work, based on Vroom’s (1964) instrumentality theory. Later, Kuhl (1977) showed that different models of motivation can have validity for different groups of individuals; in other words, achievement behavior may be governed more by calculations of required effort or by a priori self-evaluations.

Kuhl (1982, 1983) was also the first to point out that volitional issues had been neglected for decades. Motivation and volition are now conceptualized as adjacent phases within a course of action (Heckhausen & Gollwitzer, 1987; Heckhausen & Kuhl, 1985). We will come back to this in Chap. 11.

Later chapters will examine the contemporary research generated by the motivation psychology approach. Here, we need only say that Atkinson’s work focused research attention on the interac-

tion between person and situation factors. Finally, researchers approaching the subject from this perspective tackled issues relating to motives and motivation systematically, but disregarded volitional issues until the early 1980s.

2.5.2 The Cognitive Psychology Approach

Here, again, we begin with Lewin, whose field-theoretical, topological perspective is clearly apparent in the choice and treatment of the phenomena studied within the cognitive approach. What is more important, however, is the cognitivists’ concern with *motive activation*. This concern was alien to both Freud and Lewin, who assumed accumulated drive strengths or existing needs to motivate action. Freud, more than Lewin, would acknowledge that behavior might also consist in cognitions. The cognitive psychology approach reverses the emphasis, postulating that cognitions about an individual’s present state can, under certain conditions, activate motivation or influence existing motivations. What motivates us are the imbalances, the contradictions, and the incompatibilities of our cognitive representations. Various models have been developed to explain these ideas. They can all be subsumed under the heading *consistency theories* (cf. Zajonc, 1968) and have been characterized as follows:

All variants of consistency theories have in common the notion that the person tends to behave in ways that minimize the internal inconsistency among his interpersonal relations, among his intrapersonal cognitions, and among his beliefs, feelings and action. (McGuire, 1966, p. 1)

This marked the return to motivation research of a notion that had been out of favor since Darwin, namely, that reasoning can instigate motivation. It is also worth noting that cognitivists based their experimental paradigms on approaches from social psychology, as pursued by Lewin in his later years (he died in 1947), and covering:

- Interpersonal relationships
- Group dynamics
- Attitude change
- Person perception

2.5.2.1 Consistency Theories

One consistency theory is Fritz Heider's (1946, 1960) theory of cognitive balance.

Theory of Cognitive Balance According to this theory, the relations between objects or persons can represent balanced or unbalanced cognitive configurations. Heider illustrated his point by reference to triadic personal relationships. If A likes B as well as C, but learns that B does not get on with C, then there is a break in the unity of the triad for A. This motivates A to establish a more balanced relationship within the triad. For example, A might try to find ways to improve the relationship between B and C. This achieved, the configuration of interpersonal relations would attain a "good Gestalt." This postulate, that cognitive processes strive for consistency, balance, and "good Gestalt," is reminiscent of the Gestalt school founded by Wertheimer, Köhler, and Koffka, under whom Heider had studied in the 1920s (as had Lewin earlier).

Cognitive Dissonance Theory This consistency theory was developed by Leon Festinger (1957, 1964), a student of Lewin. It states that cognitive dissonance arises when at least two cognitions that are relevant to self-esteem are mutually incompatible, i.e., contradictory. The individual is motivated to reduce the dissonance by effecting changes in behavior, changes in one of the dissonant cognitions, or by searching for new information or convictions. These postulates about the motivating effects of cognitive dissonance have prompted a wealth of ingenious experiments (Chap. 4).

Most studies pertaining to consistency theory remained rather peripheral to the study of motivation in the stricter sense, primarily because they did not cover enduring motives.

- The more general significance of consistency theories is that they drew attention to the role that cognition plays in motivational processes.

Attribution Theory A further contribution by Heider (1958) not only emphasized the signifi-

cance of cognition in the psychology of motivation but also strongly influenced the mainstream of recent motivational research (Chap. 14). As social psychologists began to study person perception, efforts were made to determine why an observer attributes certain characteristics to the person observed. This prompted several attempts to construct an "attribution theory" (cf. Kelley, 1967; Weiner, 1972). Heider was interested in the genesis of an observer's commonsense explanations for the outcome of another person's behavior. Like Lewin, he distinguished between person forces and environment forces. In contrast to Lewin, however, he analyzed responses to the question of why certain outcomes occur in the context of an observer's experience and behavior. Under which conditions is someone more likely to locate the causes of a behavior or an event within the person or within the situation? Are these causes enduring characteristics (dispositions) of the person, the situation, or the object, or are they temporary states? All observations of behaviors and events seem to involve causal attributions of this kind. Especially if the observed event is, on the face of it, puzzling, there will be a search for causes. Causal attribution is not just a cognitive phenomenon like pure curiosity that has no further implications, however. Its outcomes – e.g., the intentions attributed to an associate – determine any further actions taken.

Example

Examples include situations in which actions can lead to success or failure. The major causal factors include the person factors of capability (or knowledge, power, and influence) and the situation factors of difficulty and resistance to the person forces during task performance. The relationship between these two kinds of forces predicts whether a person "can" accomplish the task – this is an enduring causal factor. This "can" must be supplemented by some variable factors if the task is to be accomplished successfully, however, namely, intention and effort (exertion, "try").

This simple model of causal factors provides easy explanations for the success or failure of an action. If, for example, somebody did not try hard, but succeeded nonetheless, then his or her ability must be far superior to the difficulty level of the task.

But what does this kind of naive causal attribution, based on perceptions of the behavior of others, have to do with motivation? Quite simply, what holds for the perception of others also holds for the perception of the self. We plan and evaluate our actions according to the causal factors we see as being important – factors like intention, ability, difficulties encountered, amount of effort required, good or bad luck, etc. It makes a big difference whether we attribute a failure to a lack of ability or a lack of effort, for example. In the latter case we are less likely to give up.

Weiner (1972, 1974), a student of Atkinson, applied the theory of causal attribution to the study of achievement motivation. This approach triggered a great deal of research activity, which demonstrated that intervening cognitions relating to the causal attribution of success and failure are important mediating processes in the motivational system. At the same time, individual differences associated with differences in motives were revealed. We will examine the motivational research inspired by attribution theory in Chap. 14.

Thus, reason – albeit a “naive” notion of the concept – was again seen as something to be taken into account in psychological interpretations of motivated behavior.

Summary

Various situation factors as well as person factors such as attitudes were at the forefront of attempts to explain motivated behavior from the perspective of cognitive psychology. To date, attitude variables have had little bearing on the study of motivation, partly because their construct character is uncertain with respect to motivation – they are

assumed to encompass cognitive, emotional, evaluative, and behavioral components – and partly because there is some doubt about their impact on behavior. Although social psychologists had not intended to engage in studies of motivation along cognitive psychology lines, they made valuable contributions to research on topics such as the following:

- Basic issues of motive arousal
- Resumption of motivation
- Motivational conflicts
- Effects of motivation
- Mediating cognitive processes in the self-regulation of behavior

In recent years, there has been a fruitful exchange about issues of causal attribution between cognitive psychology and motivational psychology.

In this context, cognitive psychology is not restricted to cognitive science or to methodological approaches based on models of information processing. Nevertheless, these theories and methods are likely to play an important role in future research on volition.

2.5.3 The Personality Psychology Approach

The 1930s saw the emergence of a “personality movement.” Its supporters did not consider either psychoanalytic theory or behaviorist learning theories to be capable of providing an adequate interpretation of individual behavior. The movement was spearheaded by the German psychologist William Stern (1871–1938), whose book *General Psychology from a Personality Perspective* was originally published in 1935. Coming from the Wundtian tradition, Stern was not significantly influenced by McDougall. He was a pioneer in differential psychology, using psychometric techniques to examine differences in the capacities and personality characteristics of individuals. What is crucial for this new direction in psychology is that Stern, deviating

from Wundt's general psychological approach, was guided increasingly by personalism, the attempt to describe and interpret the individuality of a person in terms of a unit as multiplex.

- William Stern's main explanatory mechanisms were traits, which he subdivided into "driving traits" (directional dispositions) and "instrumental traits" (preparedness dispositions), the former having motivational character.

2.5.3.1 Proponents of Personality Psychology

Stern's most influential student was G. W. Allport (1897–1967). In his book entitled *Personality: A Psychological Interpretation* (1937), Allport extended Stern's basic ideas, adding to them an eclectic variety of contemporary theoretical perspectives.

Allport's Principle of Functional Autonomy

Allport's approach reflects a mixture of German faculty psychology, McDougall's dynamism, and US empiricism. It sees the individual as a unique system that is constantly developing and is oriented toward the future. Accordingly, Allport argued that this system cannot be assessed using "nomothetic" techniques (general abstractions), but requires "idiographic" (concrete, individual) approaches. Allport's definition of a trait is similar to that of Stern.

Definition

A trait is a generalized and focalized neuro-psychic system (peculiar to the individual), with the capacity to render many stimuli functionally equivalent, and to initiate and guide consistent (equivalent) forms of adaptive and expressive behavior. (Allport, 1937, p. 295)

Traits ensure that there is relative equivalence in an individual's behavior across situations. In the 1930s, a lively interactionism debate (cf. Lehmann & Witty, 1934) had been sparked by the findings of Hartshorne and May (1928), which showed that

children's honesty/dishonesty behavior differs across situations. Allport's (1937) definition of the trait contained the key to this inconsistency problem, as became amply clear in the more recent interactionism debate. Consistency can only be expected in subjectively equivalent classes of behavior and situations. Thus, an idiographic approach is vital if we are to avoid the "nomothetic fallacy" (Bem & Allen, 1974; see Chap. 3).

Allport did not see traits as hypothetical constructs, but as realities within a person that are manifested directly in behavior. Furthermore, Allport, like Stern, distinguished between traits with a more "motivational" character and those with a more "instrumental" character, but without drawing a clear line between them.

Allport's principle of "functional autonomy of motives" became well known. It rejected theories that attribute adult motives to such sources as the vicissitudes of drives in early childhood or to particular classes of instincts or needs, as had been suggested by Freud, McDougall, and Murray. The principle of functional autonomy was designed to account for the uniqueness of individual behavior. Allport writes:

The dynamic psychology proposed here regards adult motives as infinitely varied and as self-sustaining contemporary systems, growing out of antecedent systems, but functionally independent of them. (Allport, 1937, p. 194)

Maslow's Hierarchy of Needs Allport's approach is the classic among the diverse perspectives on personality research to emerge on the basis of trait theory. This approach was continued in the USA, primarily through humanistic psychology, which was known as the "third force." After World War II, this movement also took European existentialism on board. Its main proponent was Abraham Maslow (1908–1970), along with Carl Rogers, Rollo May, and Charlotte Bühler.

Maslow's book *Motivation and Personality* (1954) was very widely read. It had a far greater influence on attitudes toward applied psychological problems and their solution than it did on empirical research. Maslow postulated a hierarchy of needs, within which lower needs have to be satisfied before higher needs can be addressed. His hierarchical ranking is as follows:

- Physiological needs
- Safety needs
- Needs for belongingness
- Esteem needs
- Needs for self-actualization

Maslow defined the latter group as “growth needs,” in contrast to the “deficiency needs” preceding it (Chap. 3).

Cattell’s Trait Theory The final approach to trait theory worth mentioning in this context is based on complex multivariate testing and statistical analyses. Its main proponent was the Anglo-American psychologist Cattell (1957, 1965, 1974), whose work followed a typically British tradition, unmistakably influenced by Galton’s differential psychology and McDougall’s dynamic instinct theory. Cattell was taught by Spearman, one of the developers of factor analysis. Using factor analytic methods, Cattell constructed what is probably the most complex model of personality traits in existence, based almost exclusively on correlations between data from questionnaires and tests on a broad variety of areas. Of the factors he extracted, three are considered to have motivational character:

- Attitudes
- Sentiments
- Ergs (drives)

Definition

Attitudes consist of dispositions toward particular objects, activities, or situations. They refer to concrete entities; this places them on almost the same level as the data observed. Sentiments comprise groups of attitudes. “Ergs” (from the Greek *ergon*, meaning “work”) are viewed as dynamic “source” variables that deliver energy to specific domains of behavior.

This understanding has much in common with McDougall’s original construct of instinct.

Cattell assigned these three factor groups to different levels, distinguishing between surface traits and source traits. He postulated a “dynamic lattice” between individual factors at the different levels and assumed this lattice to be subject to interindividual variation. For Cattell the factors are not descriptive dimensions that differ according to the method applied, but “the causes” of behavior.

Summary

To conclude, the personality theory approach to the study of motivation is dominated by trait theory and thus addresses just a few fundamental issues in motivation research, primarily:

- The taxonomy of motives
- Motivated goal orientation
- The effects of motivations

This approach presents us with a wealth of dispositional variables, but with few functional variables (e.g., motivation as a process or volition). The orientations and perspectives discussed thus far are outlined in Fig. 2.2.

2.6 Associationist Theories

The associationist approach to the study of motivation can be split into two branches inspired by the work of Thorndike and Pavlov, respectively:

- The learning psychology approach
- The activation psychology approach

Both had their origins in Darwinian theory and, more specifically, in a new conception of the old hedonistic principle, modified from the perspective of evolutionary theory.

It was Herbert Spencer (1820–1903) who suggested that those behaviors that facilitate successful interaction with the environment, i.e., that have survival value, must have become associated with pleasurable sensations over the course of evolutionary development. The physiological models of the day held that pleasurable sensations resulted in greater permeability of the nerve tracts, accompanied by an arousal state that

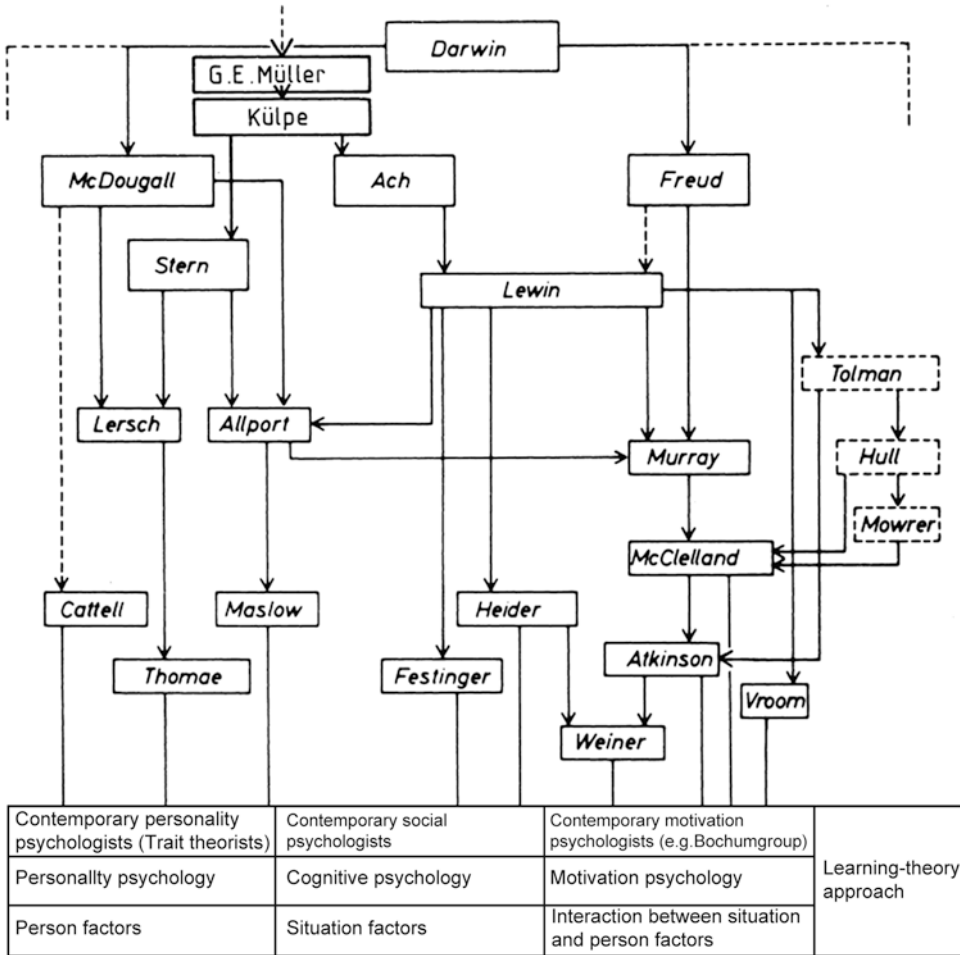


Fig. 2.2 Personality theories in the development of motivation research

allowed better “stamping in” of successful actions, making it easier to reproduce them later. For Spencer, pleasure and displeasure were not goal states to be desired or avoided for their own sake, as had been the postulate of classical hedonism for more than 2,500 years (i.e., since Aristipp). Rather, he viewed them as attendant circumstances that influence the acquisition of new behaviors and increase the probability of previously successful behaviors reoccurring. With these ideas, Spencer anticipated Thorndike’s “law of effect,” Hull’s “drive-reduction theory,” and Pavlovian activation theory.

2.6.1 The Learning Psychology Approach

2.6.1.1 Main Proponents

Thorndike, Founder of Experimental Psychology of Learning The experimental psychology of learning had its beginnings in the 1890s. Its founder, Edward Lee Thorndike (1874–1949), was guided by the Darwinian notion that there must be a continuum of intelligence and learning ability in animals and humans. Working with cats, Thorndike sought ways of teaching the animals to solve problems. A cat was

deprived of food and placed in a “puzzle box.” Food was placed outside the box. The cat, which was restless because it was hungry, would accidentally move certain levers that opened a gate, giving access to the food. As early as the next trial, the animal would show instrumental, goal-directed behavior, i.e., a learning effect.

The analogy to Darwin’s notion of evolution is clear. In a given environmental situation, the animal produces a variety of available responses. Under changed environmental conditions, only a few of these responses will lead to success, i.e., have survival value. Responses are selected on the basis of “trial and error,” by trying out various possibilities one after the other. To draw an analogy between the available responses and organisms engaged in the “fight for survival,” only a few adaptive responses will “survive,” while the rest “become extinct.” Thorndike (1898) proposed the “law of effect” to explain this pattern:

Definition

Of several responses made to the same situation, those which are accompanied or closely followed by satisfaction to the animal will, other things being equal, be more firmly connected with the situation, so that, when it recurs, they will be more likely to recur; those which are accompanied or closely followed by discomfort to the animal will, other things being equal, have their connections with that situation weakened, so that, when it recurs, they will be less likely to occur. The greater the satisfaction or discomfort, the greater the strengthening or weakening of the bond. (Thorndike, 1898, 1911, p. 2441)

Satisfaction – in this case, of the hunger drive – was seen as creating a new stimulus-response bond for learning, a process that was later called “reinforcement.” Thorndike (1898) viewed the observed learning phenomena as analogous to physiological processes, i.e., the bonding of neuronally represented elements of stimulus and response. At first, he was not aware

of the motivational factors inherent in the observed behavior. Nevertheless, his learning experiments were also motivation experiments. The animal had to be deprived of food prior to the experiment. How else can they (unlike humans) be motivated to learn? To this extent, experimental learning research with animals, which has now evolved to a major field of research activity, has always incorporated aspects relating to motivation research and produced many very relevant findings. In human research on learning, in contrast, motivational aspects were, at first, largely overlooked.

- Stimulus-response bonds (*S–R bonds*) were soon accepted to be the basic units of behavior.

Thorndike did not disregard motivational issues totally. Certain events can only be satisfying if the organism is in a state of “readiness.” Thus, food can only lead to a state of satisfaction – and facilitate the formation of new *S–R* bonds – if the organism is hungry. Thorndike (1911) originally referred to this readiness as susceptibility for the formation of a certain stimulus-response element. Later (1913) he introduced the law of “readiness.” In order to avoid any mentalistic connotations, “readiness” was conceptualized as a momentary increase in the conductivity of neurons. Although he was unable to provide a satisfactory solution to the problem of motivation, his influence on the development of learning theories can hardly be overestimated. Learning theories were not only associationist but also specified what is being associated with what, namely, stimuli with responses. Thorndike labeled the association of a stimulus with a response “habit” (Sect. 2.2.2).

Definition

A “habit” is a pattern of responses that does not involve conscious processes, either because it became automated after having been under conscious control at some earlier point or because it was acquired without conscious control from the outset.

It was common practice at the time to skirt motivational issues by attributing goal-directed behavior to “instincts.” Following the instinct controversy, the term “drive” – first proposed by Woodworth (1918) – gained currency. Woodworth (1869–1962) also made a fundamental distinction between the “drives” that initiate behaviors and the “mechanisms” that are then activated and that determine the course of the behavior, e.g., stimulus-response bonds. At the same time, he was the first to take the step of inserting a hypothetical construct between S and R, namely, “O” for organism in a particular drive state.

Tolman’s Influence on the Psychology of Learning and Motivation Edward C. Tolman (1886–1959) was the first to provide a rigorously defined conception of hypothetical constructs, which he called “intervening variables.” These must have close conceptual ties to the antecedent manipulations and subsequent observations. In order to hypothesize a hunger drive of a given strength, for example, the antecedent manipulated period of food deprivation must covary with the subsequently observable behavior of the animal, e.g., general restlessness, running speed, response latency, etc. Tolman (1932) carefully analyzed the criteria of goal-directed behavior.

Tolman was the first to clearly distinguish between motivation and learning. Before that, and indeed thereafter, the two were regularly confounded. For Tolman, learning was essentially the acquisition of knowledge, taking the form of intervening variables such as the cognitive map, means-end readiness, and above all expectancy. In order for learning to manifest itself in behavior, however, there must be motivation, the efficacy of which is determined by two intervening variables:

- “Drive”
- “Demand for the goal object” (analogous to Lewin’s demand character; later the term “incentive” was commonly used)

Experiments on “latent learning” provided the crucial demonstration for the need to distinguish between learning and motivation (Chap. 5). Tolman was a “psychological behaviorist,” and

his notions closely resemble those of Lewin, who later influenced him directly. His is not a purely associationist theory, because he neither postulated fixed stimulus-response bonds on the cognitive side nor did he invoke drive reduction as the basis for learning on the motivational side. Instead, he drew attention to cognitive intervening variables that direct behavior toward a goal as soon as motivational intervening variables become activated.

- Tolman’s work forged an important link between the psychology of learning and the psychology of motivation. His influence on the latter was via Atkinson.

Hull’s Drive Theory Tolman’s influence is also apparent in the works of Clark L. Hull (1884–1952), the major theorist of the learning psychology approach. Hull adopted Tolman’s theoretical conception of intervening variables (calling them theoretical constructs). Later, the concept of “incentive” also became an important construct in Hull’s model. It was used to explain residual behavioral differences in cases of equal drive strength and equal learning outcomes (habit strength). Hull proposed a complex theoretical network consisting of 17 postulates and 133 derived theorems. From the perspective of motivational psychology, he founded drive theory. Essentially, he adopted Thorndike’s approach, but elucidated it further and stripped it of mentalistic connotations. “Satisfaction” of a need, which facilitates the formation of S–R bonds, became “drive reduction.” A distinction was now also made between need and drive.

Definition

A need is a specific deficiency or disturbance within the organism (e.g., hunger, thirst, or pain) that elicits a nonspecific drive of a certain strength, capable of initiating behavior. For Hull, needs are essentially observable or at least manipulable variables, whereas drives are theoretical (hypothetical) constructs.

Hull's approach is made clear in the following definition – which also reflects a Darwinian perspective:

When a condition arises for which action on the part of the organism is a prerequisite to optimum probability of survival of either the individual or the species, a state of need is said to exist. Since a need, either actual or potential, usually precedes and accompanies the action of an organism, the need is often said to motivate or drive the associated activity. Because of *this* motivational characteristic of needs they are regarded as producing primary animal drives.

It is important to note in this connection that the general concept of drive (D) tends strongly to have the systematic status of an intervening variable or X, never directly observable. (Hull, 1943, p. 57) (Author's emphasis)

In the last revision of his system, Hull (1952) essentially attributed behavior partly to a motivational component and partly to an associative component. The motivational component, which is the product of drive (D) and incentive (K), has a purely energizing function. The associative component determines which of the available S – R bonds (“habits,” SHR) will be implemented in response to the internal and external stimuli of a given situation. The two components are multiplied with each other to determine the behavior tendency, a vectorial concept combining force and direction. This is the *reaction-evocation potential* (SER).

$${}_s E_R = f({}_s H_R \times D \times K)$$

Habit strength (SHR) is dependent on the number of and delays in preceding reinforcements, i.e., on how often and how quickly a stimulus-response bond has previously been followed by drive reduction.

Kenneth W. Spence (1907–1967) was a student of Hull and later worked with him to advance Hull's theory of motivation and learning in some important respects. Spence was particularly interested in the experimental and conceptual analysis of “incentive” in the light of Tolman's findings. (Incidentally, Hull's use of the symbol “ K ” for “incentive” in his formula reportedly reflects his appreciation of Kenneth Spence's work.)

Spence (1956, 1960) considered incentives, like habits, to be acquired through learning. His theoretical explanation for the acquisition and manifestation of incentives is associationistic, based on the mechanisms of “fractional anticipatory goal responses” ($r_G - s_G$) that had been postulated by Hull (1930). The basic idea is that fragments of an earlier goal response (r_G) are elicited by familiar stimuli on the way to reaching (or even perceiving) a goal and that these are in turn associated with fragments of an earlier goal object (s_G). With this mechanism, Hullian theory can account for Tolman's hypothetical construct “expectancy” and for what cognitive (“mentalistic”) theories call anticipation or expectation. This explanation, in terms of associationist theory, endows the fractional anticipatory goal response ($r_G - s_G$) with motivational characteristics. The response is postulated to produce its own stimulation that – along with the drive stimuli – increases the internal stimulation on the organism. Thus, for Spence, the relationship between drive and incentive is additive, and not multiplicative, as had been suggested by Hull:

$$E = f(D + K) \times H$$

Now there can be an effective response potential (E), i.e., learning, in the presence of incentive stimuli alone, without drive stimuli, in other words, when the organism is not “driven” but “attracted” to a goal. This would be a case of pure incentive motivation.

Spence rejected the learning component of Hull's theory, i.e., habit formation, and the notion that it is drive reduction that enforces the S – R bond. For Spence, drive reduction determines incentive strength (K) that, along with drive (D), governs the intensity with which a learned response is performed. To this extent, drive reduction is a purely motivational issue and cannot explain learning. Spence saw Thorndike's “law of effect” as an indisputable fact (“empirical law of effort”), but not as an explanation for learning. Instead, he reverted to the old associationistic principle of *contiguity*.

Definition

The strength of a habit is solely dependent on the frequency with which a response has been made to a stimulus in temporal or spatial contiguity.

This is also the basic associationistic model for classical conditioning (see Pavlov, below), from which the fractional anticipatory goal responses ($r_G - s_G$) are derived. Spence was the first of the learning psychologists to measure individual differences in motivation and their effects on learning outcomes. This work also inspired researchers taking a motivation psychology approach (e.g., Atkinson and Weiner). The motive examined was “anxiety” (Taylor, 1953), which was assumed to produce a high general drive state or arousal state in the presence of particular tasks. According to “inference theory,” this then activates competing responses that interfere with performance, particularly on difficult tasks (Taylor & Spence, 1952).

2.6.1.2 Applications of the Learning Psychology Approach to Motivation Research

Three of Hull’s students and collaborators advanced the learning psychology approach to motivation research by applying it to specific issues:

- Neal E. Miller
- Judson S. Brown
- O. Hobart Mowrer

Miller and the psychoanalyst Dollard had soon become interested in Freud’s psychology of motivation and applied learning theory to social and psychotherapeutic issues. They developed a “liberalized S–R theory” (Miller, 1959; Miller & Dollard, 1941) and an influential model of conflict behavior (see box on “Classical Learning Experiments” below), which they substantiated by experimental means (1944). Using fear as an example, Miller demonstrated the existence of “acquired drives” (1948, 1951), expanding on

Hull’s drive theory. He later focused on physiological brain mechanisms, postulating the existence of what he called “go-mechanisms” with an incentive function (1963).

Aside from drives, strong external stimuli can also have a motivating function. In their book *Personality and Psychotherapy* (1950), Dollard and Miller state:

All that needs to be assumed here is (1) that intense enough stimuli serve as drives (but not all drives are strong stimuli), (2) that the reduction in painfully strong stimuli (or of other states of drive) acts as a reinforcement, and (3) that the presence of a drive increases the tendency for a habit to be performed. (Dollard & Miller, 1950, p. 31)

Drive is no longer a uniform, direction-nonspecific, purely energizing factor, as had been suggested by Hull. The drive cues associated with it determine which response will be emitted.

The drive impels a person to respond. Cues determine when he will respond, where he will respond, and which response he will make (p. 32).

To summarize, stimuli may vary quantitatively and qualitatively; any stimulus may be thought of having a certain drive value, depending on its strength, and a certain cue value, depending on its distinctiveness (Dollard & Miller, 1950, p. 34).

Like responses, drives can become associated with previously neutral stimuli.

Study*Classical Learning Experiments*

In one of their famous experiments (Miller, 1948, 1951), rats were given painful electric shocks through a grid in the floor of a white-walled compartment until they had learned to open the entrance to an adjacent black compartment. After a few trials, the animals showed signs of fear as soon as they were placed in the white compartment, even when the grid was not charged. Previously neutral stimuli now aroused fear, a case of classical conditioning. Fear was learned and, at the same time, became a drive state, because the animals

now learned new responses to escape to the black compartment even without the presence of electric shocks. These experiments became the prime rationale for the assumption that “higher motives,” learned or secondary drives, arise from originally organismic drives, particularly from the fear associated with painful states.

Another classical experiment with rats formed the basis for Miller’s (1944) well-known model of conflict resolution. Given the stimulation of a particular drive state, the tendency to approach a positive goal object or to avoid a negative one increases with proximity to the goal. The approach gradient is less steep than the avoidance gradient, however. If the goal region is both positive and negative – e.g., because the hungry animal found food there, but also received a shock – there will be a point, at a particular distance from the goal region, where the approach gradient and the avoidance gradient intersect. This produces conflict. Any further approach results in fear becoming dominant; any further avoidance response results in hunger becoming dominant. The animal oscillates in its behavior.

This model of conflict has also proved valuable for research on humans, e.g., in the context of psychotherapy. Unlike Miller, Brown (1961) remained committed to Hullian drive theory. For him, drive was a general, activating, and direction-nonspecific intervening variable. Hence, there is only one drive and no acquired, secondary drives. There are, however, many sources that contribute to this general and uniform drive; these may be innate and organismic or acquired. There are also secondary motivational systems. All of these are based on the conditioning of certain stimuli with fear states that were originally associated with physical pain. Up to this point, Brown’s conceptualization is highly reminiscent of Miller’s notion of fear as an acquired drive. Brown goes further, however,

postulating that fear can become linked to a whole range of different stimulus constellations, forming unique motivational systems that become energized. Brown’s (1953) example of this is the money motive.

Mowrer’s Theory of Avoidance Learning O. H. Mowrer, the third major learning theorist beside Hull and Spence, also studied the function of fear in motivating avoidance learning. His most significant contribution, in terms of a theory of motivation, was to introduce the emotions of expectancy, hope, and fear, as intervening variables mediating between features of the situation and the response. This represents a decisive step within classical *S–R* theory, leading to a conceptualization of motivation that assigns a central role to such cognitive mediating processes as expectancy. McClelland’s theory of motivation (McClelland et al., 1953) clearly shows the influence of Mowrer’s position in this respect. In turn, Mowrer was influenced by the work of Young, a representative of the psychology of activation (see below).

Mowrer (1939) began by examining the role of fear or anxiety. He saw the relevance of Freud’s (1952b) notion that fear is a signal of impending danger, itself an unpleasant state that instigates behavior to avoid the danger. According to Mowrer, fear (or anxiety) is the anticipation of fear. It is a conditioned form of the pain response originally elicited by a strong adverse stimulus. Accordingly, fear has a motivating function, reinforcing all behaviors that serve to reduce it. As Mowrer (1960) himself put it later, this represents a reversal of ideas about “fear learning”; here, learning is reinforced by an expectation of being relieved of fear.

Example

Brown’s money motive example was based on the observation that, when children are injured and suffer pain in the early years of life, their parents display concern and fear. An associative bond is formed between pain and parental con-

(continued)

cern. If the child now perceives the same concerned expressions when his or her parents talk about money problems (e.g., “We’re broke”), the association with pain is reactivated, i.e., fear of pain and anxiety; this results in an association between fear and the word “money.” Whenever there is talk of money (e.g., “We’ve no more money to buy food”), a state of anxiety is induced. This state can be diminished through appropriate instrumental activities (in the same way as the rats in Miller’s experiment learned new escape responses to get from the white compartment to the black one even without the presence of shock). A reduction in anxiety can be attained by securing a regular income, for example. This leads to the formation of a “work motive,” which, upon closer inspection, serves to reduce the fear of being broke. Although this example seems somewhat contrived, it is consistent with Brown’s drive theory.

Finally, Mowrer (1960) postulated two basic types of reinforcement mechanisms that underlie all explanations of behavior:

1. Drive induction (“incremental reinforcement”):
Whenever behavior is punished, a conditioned association with the expectancy of fear is produced (“fear learning”).

2. Drive reduction (“decremental reinforcement”):
Whenever behavior is rewarded, a conditioned association with the expectancy of hope is produced (“hope learning”).

Correspondingly, there are complementary expectancies of “relief” and “disappointment”:

Relief occurs when an induced fear state is diminished by the consequences of a response (decremental reinforcement).

Disappointment occurs when an induced hope state is diminished by the consequences of a response (incremental reinforcement).

According to Mowrer, these four classes of expectancy emotion (hope and disappointment, fear and relief) and any increases or decreases in

their intensity determine, for any given situation, which type of behavior will be chosen and pursued and thereby learned and reinforced.

Here, Mowrer deviates from the classical *S–R* notion that learning and behavior result from an unmediated association between stimulus and response. Instead, he suggests that expectancy emotions become associated with the stimuli. Stimuli can be either independent of the organism’s behavior (and originate externally or internally within the organism), or they can be dependent, i.e., feedback from one’s own behavior. Once emotions of expectancy have become associated with such stimuli, they can guide behavior in a flexible and appropriate manner by facilitating responses that increase hope and relief or decrease fear and disappointment.

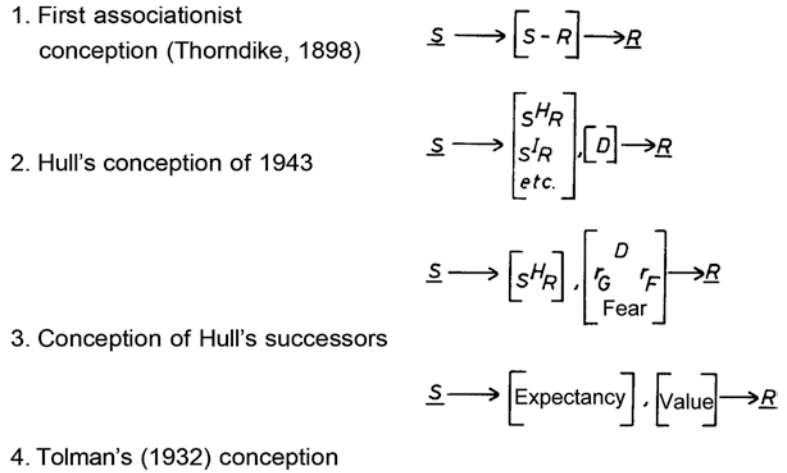
Mowrer also sees the basic mechanisms of associative learning in classical conditioning. For him, instrumental conditioning – since Thorndike the primary explanatory principle of learning – is a subclass of classical conditioning.

- What characterizes explanations of behavior within the learning psychology approach is the focus on situational rather than dispositional, person factors. Behavior is guided by stimuli that can be either external or response dependent, i.e., internal. Motivational variables such as drive are frequently also conceptualized as “inner” stimuli.

Two types of intervening (construct) variables mediate between a situation (“stimulus”) and behavior (“response”):

- Structural components:
- These give behavior direction, goal orientation, and utility. They reflect the effect of learning in terms of Tolman’s expectation (what leads to what) or the Hullian concept of habit (*S HR*) or conditioned inhibition (*S IR*).
- Motivational components:
- These initiate and energize behavior. In Tolman’s terms, they are need-dependent demands for the goal object; in Hull’s (1943) terms, need-dependent drives (*D*); in the terms of Hull’s successors, other activating mecha-

Fig. 2.3 Stages in the development of learning theory in terms of the motivational component of behavior (Based on Bolles, 1974)



nisms such as stimulus-evoked fractional goal responses or fear responses (r_G or r_F , respectively).

Figure 2.3 shows the stages of development of learning theory in simplified form. S and R (“stimulus” and “response”) designate the observable situational or behavioral variables. The connecting links shown in square brackets represent the structural and motivational components (in that order). The first stage represents Thorndike’s (1898) position at the turn of the last century. It is a purely associationistic and “mechanistic” model with no motivational component. Although Tolman’s conceptual model predates that of Hull and his successors, it is in fact a more advanced variant in terms of a theory of motivation, because it contains the foundation for the expectancy-value models that dominate contemporary motivational research.

Russian physiology, who provided the decisive input for Pavlov’s work. In 1863 (edited in 1968), Sechenov published his major work *Cerebral Reflexes*, which included a discussion of the inhibiting influences of the cortex on the subcortical centers. Working on the “digestive reflex” at the turn of the century, Pavlov demonstrated that unlearned reflex-inducing stimuli (unconditioned, innate stimuli) can be replaced by learned (conditioned) stimuli. This requires the presentation of the stimulus to be conditioned slightly (about half a second) before the unconditioned stimulus. After repeated pairings of the two stimuli, the new conditioned stimulus is sufficient to elicit the response. A typical example of classical conditioning is given below.

2.6.2 The Activation Psychology Approach

2.6.2.1 Main Representatives

Pawlow, Inventor of Classical Conditioning

Ivan P. Pavlov (1849–1936) was, along with Vladimir Bekhterev (1857–1927), the founder of reflexology, the study of conditioned reflexes. The process by which such reflexes are established was later called *classical conditioning*. It was Ivan Sechenov (1829–1905), the doyen of

Example

The classic example is the triggering of the salivary response in dogs, where salivation is measured by means of a fistula implanted in the esophagus. If food (an unconditioned stimulus for salivation) is preceded repeatedly by a formerly neutral stimulus (e.g., a sound, a light signal, or pressure on the skin), then this formerly neutral stimulus will eventually produce salivation without food being presented. Thus, an unconditioned stimulus “reinforces” the association between a formerly neutral stimulus and the response in question.

The concept of reinforcement was first introduced by Pavlov and alluded to the physiology of the central nervous system in several ways. Reinforcement is the conceptual analog to what Thorndike termed “satisfaction” to explain the law of effect (in *instrumental conditioning*). Pavlov and other Russian physiologists were also able to show that a conditioned stimulus itself has acquired reinforcement characteristics, i.e., can serve to condition a formerly neutral stimulus, producing higher-order conditioning. For Pavlov this was the basis of all higher nervous activity (cf. Angermeier & Peters, 1973).

On the face of it, it would seem unlikely that the study of reflexive behavior of largely immobilized animals in experimental settings would have much to contribute to the study of motivation. Nevertheless, two critical conditions led to Pavlov becoming the founder and instigator of a multifaceted approach to motivation research based on the principle of activation:

- First, he was a physiologist (he won the Nobel Prize in 1904 for his studies on the physiology of digestion) and attempted to explain the learning phenomena he observed in terms of the underlying neurophysiological mechanisms in the brain.
- Second, he postulated an interaction between two underlying processes: excitation and inhibition.

For Pavlov, excitation serves to activate behavior; in terms of the traditional idea of motivation, it has an energizing function. Furthermore, *orienting reactions* accompany excitation states and play a part in the genesis of conditioned reflexes. Orienting reactions became the major focus of Russian research on activation.

Pavlov’s writings soon became known to US learning psychologists, partly through a lecture that he gave in the US in 1906 and partly through an overview of his work by Yerkes and Morgulis (1909). Pavlov, like the US learning theorists, was opposed to the search for the basic elements of psychological functioning by means of introspection. Instead, he too was interested in finding answers to the question of what leads to what, as reflected by “observables,” i.e., changes in exter-

nal behavior. John B. Watson (1878–1958), who later became the evangelistic spokesman for this antimentalist movement called behaviorism, was strongly influenced by Pavlov’s reflexology. Watson’s demonstration of experimentally induced avoidance responses in a 9-month-old child by means of classical conditioning became a classic in the field (Watson & Rayner, 1920; for a critical analysis of the impact of the Little Albert study on the psychology textbooks of the next 50 years, see Harris, 1979).

Operant Conditioning After Skinner At first it was difficult to relate conditioned reflexes to Thorndike’s “law of effect,” the supposed basis of all learning. Skinner (1935) was the first to propose a fundamental division of all behavior into two categories, response substitution a’ la Thorndike and stimulus substitution a’ la Pavlov. Skinner later dubbed the first category “operant behaviors” or “operants” because they act upon the situation, “operate” upon it, and change it. Factors that increase the likelihood of a particular response occurring in the future were labeled “reinforcers.” Skinner adopted the term “reinforcement” from Pavlov, finally establishing it in the US psychology of learning. For Skinner, the term reinforcer has no physiological connotations; it simply equates with an increase in the probability that a particular behavior will occur. The process is called *operant conditioning* (analogous to Thorndike’s instrumental conditioning). Skinner called the second category of response “respondent behavior” or “respondents” because an available response is simply elicited by a stimulus. The acquisition of new eliciting stimuli is dependent on classical conditioning, as demonstrated by Pavlov.

This was an extremely important distinction for the later development of learning theory; with it Skinner influenced both the Thorndikian and the Pavlovian tradition. However, Skinner (1938, 1953) was more interested in empirical than in theoretical issues. He devoted himself to a detailed empirical analysis of all aspects of operant conditioning and used the knowledge gained to develop a number of applied techniques, including programmed instruction (Skinner, 1968). The influential behavior-therapy movement is also derived

directly from his specification of the contingencies of operant conditioning.

It is not easy to categorize Skinner with respect to the evolution of thinking in motivational research; after all, he rejected all hypothetical constructs and every theoretical construction that goes beyond the formulation of if-then relationships (see the excursus below). He even avoided labels alluding to motivation, such as hunger, referring instead to “deprivation,” which was

operationally defined in terms of the period of time the animal has been deprived of food or in terms of the resulting weight loss. Of course, both deprivation and the corresponding “reinforcement” (response consequences that increase the likelihood of the particular response) incorporate motivational aspects identified by learning and motivation theorists as intervening variables, including need, drive or satisfaction, and reward or expectation.

Excursus

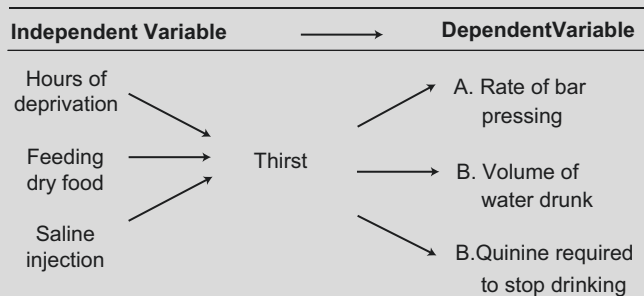
Miller’s Criticism of Skinner

Miller (1959) pointed out that Skinner’s anti-theoretical position becomes untenable when behavior is to be explained in terms of any more than two independent and dependent variables. There are, for example, three different manipulations that can serve as independent variables in the manipulation of drinking behavior in rats: hours of deprivation, dry feeding, and injection of a saline solution. Likewise, three different indicators of drinking behavior, the dependent variable,

have been used: rate of bar pressing, amount of water consumed, and amount of quinine in the water needed to terminate drinking.

If we were to abandon the hypothetical construct “thirst” as mediating between the three independent variables and the three dependent variables (Fig. 2.4), we would have to postulate nine different if-then relationships. Not only would this be unparsimonious, it would be redundant, since the effect of each of the independent variables can be demonstrated with each of the dependent variables.

Fig. 2.4 Independent and dependent variables related to drinking behavior as an example for the value of taking a hypothetical construct (“thirst”) as a mediating (intervening) variable (Based on Miller, 1959, p. 278)



Skinner cannot be categorized as belonging to the activation psychology strand of the study of motivation; rather, he forges the link between the research traditions of Thorndike and Pavlov.

The true representatives of the psychology of activation share four major approaches to theory construction:

1. They draw heavily on neurophysiological findings and theories about the functioning of

the brain. To this extent, the explanatory constructs hypothesized are not neutral, but have considerable physiological implications. Activating systems in the brain stem are accorded a key role.

2. They make very general statements about the activation and direction of behavior. The emphasis is on finding regular relationships that have general applicability, at the cost of detailed, content-specific determinants of behavior.

3. Affect and emotion are of more relevance than in other theories of motivation.
4. They endeavor to identify the unique structural patterns on the stimulus side that produce generalized, activated behavior and imbue it with an approach or avoidance orientation.

2.6.2.2 Discoveries and Developments Within the Psychology of Activation

Two discoveries relating to the physiology of the brain proved particularly inspiring for researchers interested in the psychology of activation. One was the discovery of the *ascending reticular activation system* (ARAS).

ARAS and the Reinforcement Center Moruzzi and Magoun (1949) found that electrical stimulation of the reticular formation in the brain stem results in a change in the electroencephalogram, in what are known as “activation patterns.” The various conditions of activation range from sleep and sleepiness to high levels of excitation. They have been found to be accompanied by changes in performance proficiency on a variety of tasks. This relationship describes an inverted-U function, with intermediate levels of activation being most conducive to performance. Emotions and affects have also been shown to be related to different levels of activation.

Under natural conditions, there are two sources of nonspecific stimulation of the ARAS:

- The afferent sensory nerves that send collaterals to the reticular formation
- Efferent cortical impulses arriving at the ARAS. Lindsley (1957) was the major force in calling attention to the significance of these findings on the physiology of the brain for the study of behavior.

The other discovery was the identification of a “reinforcement” or “pleasure center” in the hypothalamus of the rat brain. If this area is stimulated by means of implanted electrodes, rats will learn to produce the responses that preceded this stimulation without previous deprivation or actual drive reduction (Olds, 1955, 1969; Olds &

Milner, 1954). The founder of this strand of research was James Olds, a former student of Hebb.

Hebb’s Ideas of Cell Assemblies and Phase Sequences It was the Canadian psychologist Donald O. Hebb who became the most influential mediator between Pavlov’s physiological approach and the new psychology of activation. In his book *Organization of Behavior* (1949), he restricted the study of motivation to explanations for the direction and persistence of behavior. From Hebb’s perspective, there is no need to explain the energizing of behavior, because the organism is constantly active and metabolizing energy. The only question is why energy is released at particular loci of the organism and characterized by a particular spatial and temporal pattern of firing. Hebb attributes these effects to “cell assemblies” that are gradually built up through repeated stimulation, forming a closed system that facilitates motor response sequences. A cell assembly is capable of producing other cell assemblies, frequently in concert with other sensory input. This leads to the formation of what Hebb calls “organized phase sequences,” for him the physiological equivalent to the cognitive processes that guide behavior.

With a play on words, Hebb later (1953) turned the CNS (central nervous system) into a conceptual nervous system. Drawing on the findings of the ARAS studies, Hebb differentiated between the arousal function and the cue function of all stimulus inputs. Before a sensory input can exercise a cue function (i.e., guide behavior), there must be a certain level of nonspecific activation (Hebb’s analog to “drive”), otherwise no integrated phase sequence will occur (e.g., boredom brought on by sensory deprivation is associated with a rapid deterioration in performance on relatively simple tasks).

Conversely, the arousal level can be too high if the information input deviates too sharply from the familiar (or the stimulus is simply too intense), leading to a breakdown in the previously formed phase sequence. This may elicit emotions of displeasure, irritation, and even fear. Minor deviations from previously established

phase sequences are pleasurable, however, and motivate the continued pursuit of current behavior. Moreover, they stimulate further formation of phase sequences.

This final postulate corresponds to the processes of *accommodation* that are central to Jean Piaget's (1936) psychology of cognitive development. Here again, we encounter the idea of discrepancy, which – as we saw earlier – plays an affect-producing and therefore motivating role in McClelland's theory of motivation. Small departures from the familiar and the expected have positive emotional valences and motivate approach and persistence; larger discrepancies have negative valences and motivate avoidance, causing a break in the behavioral sequence. In this respect, McClelland's theory (1953) shows the influence of Hebb's conceptualization concerning the effects of discrepant phase sequences.

Arousal Potential After Berlyne Daniel E. Berlyne (1924–1976) developed the most extensive theory of motivation based on the principle of arousal. He expanded Hebb's ideas and combined them with the principles underlying the work of Piaget (cognitive accommodation) and Hull (integrative neo-associationism). Based on neurophysiological findings concerning the ARAS and reinforcement centers, Berlyne (1960, 1963, 1967) investigated the stimulus aspect of activation (arousal), on the one hand, and arousal-dependent motivational effects, on the other. On the stimulus side, it is the nature of the information and the resulting conflict that determine the arousal function. Berlyne used the term “collative variables” to designate these stimulus and conflict characteristics.

Definition

“Collative” means that incoming information is subjected to processes of comparison that can lead to greater or lesser incongruities and conflicts with the familiar and the expected.

Berlyne distinguished four types of collative variables:

- Novelty
- Uncertainty
- Complexity
- Surprise value

Aside from these collative variables, there are three further types of stimuli that have arousal functions:

- Affective stimuli
- Intense external stimuli
- Internal stimuli arising from need states

The combination of these stimuli produces what Berlyne called *arousal potential*. In contrast to Hebb, Berlyne was able to present a variety of findings demonstrating the need for a distinction to be made between the arousal potential and the resulting level of activation. The relationship between the two is not linear, but describes a U function. Both low and high arousal potentials result in high levels of activation, are experienced as unpleasant, and trigger activities serving to reduce the level of activation, i.e., leading to an intermediate level of arousal potential, which is the optimal state.

In Berlyne's (1960) words:

Our hypotheses imply, therefore, that for an individual organism at a particular time, there will be an optimal influx of arousal potential. Arousal potential that deviates in either an upward or a downward direction from this optimum will drive inducing or aversive. The organism will thus strive to keep arousal potential near its optimum. (Berlyne, 1960, p. 194)

Among the arousal-dependent motivational effects, Berlyne distinguished between exploratory and epistemic behavior (the latter refers to the acquisition of knowledge and insight through cogitation). If the arousal potential is too high, it will motivate focused exploratory behavior, i.e., the closer inspection of the incoming information in order to reduce the arousal potential. If the arousal potential is too low (boredom), it will result in diverse exploration, initiating a search for greater stimulus variety and entertainment, or curiosity.

Excursus

Young's Attempt to Integrate Psychology and Physiology

Paul Thomas Young founded a unique and independent branch within the motivational psychology of activation. As mentioned earlier, his *Motivation of Behavior* (1936) was the first English-language book to feature the term motivation in its title. Young proposed that physiological and psychological explanations of motivational events represent two different perspectives on the same phenomena. Beginning in the 1940s, Young (1941, 1961) devoted his research activities to food preferences in rats. He showed that even the behavior of satiated animals can be motivated by food and that the level of motivation depends on the type of food offered. Some substances appear to have intrinsic affective activation value, an incentive (e.g., tastiness) that is independent of the drive strength arising from the organism's need states. Moreover, in postulating "evaluative dispositions" (1959) that are linked to affective activation and therefore capable of reinforcing behavior, Young did not neglect the motivational effects of need states and drive strength.

Psychophysiological Approaches Elizabeth Duffy (1932) initiated psychophysiological research in the 1930s, even before the discovery of the ARAS. She was able to correlate indicators of neurovegetative functioning (e.g., muscle tone and galvanic skin responses) with performance measures and explained the relationships observed by assuming a kind of central activation function (analogous to the present-day concept of arousal), the physiological basis of which she attributed to the autonomic nervous system. Duffy (1934, 1941) also attempted to clarify the concept of emotion in terms of activation phenomena; Young's influence on her work is apparent here. Her book *Activation and Behavior* (1962) reviews

the findings of activation research and presents her theoretical models of motivation. She summarizes her main findings on the relationship between activation and performance as follows:

The degree of activation of the individual appears to affect the speed, intensity, and co-ordination of responses, and thus to affect the quality of performance. In general, the optimal degree of activation appears to be a moderate degree, with the curve expressing the relationship between activation and performance taking the form of an inverted U. (Duffy, 1962, p. 194)

A more complete and systematic theory of motivation, covering the findings on activation reported by Duffy and others, was presented by Dalbir Bindra (1959). He began by linking up the conceptualizations of Hebb, Skinner, and Hull. According to Bindra, no distinction can be made between emotional and motivated behavior. Motivated behavior is characterized by its goal directedness:

Goal direction is thus a multidimensional concept. Appropriateness, persistence and searching . . . can be looked upon as some of the dimensions that are involved in judging behavior as more or less goal-directed. (Bindra, 1959, p. 59)

Like Skinner, Bindra attributed goal directedness primarily to reinforcing events. As he saw it, the manifestations of a given motivated behavior result from a variety of interacting factors, including sensory cues, habit strength, arousal level, blood chemistry, and a special "hypothetical mechanism," the "positive reinforcement mechanism" (PRM), which carries out the functions of the reinforcement centers discovered by Olds. In a later version of his theory, Bindra rejected the learning theorists' postulate of associations being formed through reinforcement (1969, 1974). Like Young, he now emphasized the importance of the incentive object, which – along with other stimulus aspects and certain organismic states, the "central motivational states" – induces motivation and initiates and guides behavior.

- Along with Bolles (1972), Bindra is the leading proponent of a theory of incentive motivation among the animal learning theorists (Chap. 5). His new conceptualizations of

incentive motivation run essentially parallel to the notions developed 40 years earlier by Lewin and Tolman.

Sokolov's Orienting Reactions The most prominent representative of the Russian branch of the activation psychology approach to the study of motivation is Sokolov (1958, English translation, 1963). His work represents an extension to Pavlov's reflexology, incorporating the advances that had been made in neurophysiological measurement techniques and recent findings on brain functioning (e.g., the ARAS). He was primarily interested in the study of orienting and avoidance reactions, identifying their triggering conditions and analyzing their scope and effects. Berlyne incorporated the findings of Sokolov and his colleagues in his theory of motivation, thus establishing their influence on Western activation-oriented research.

Definition

Orienting reactions are complex short-term processes which, in response to a decisive change in the stimulus field, trigger a series of physiological and psychological processes, all of which increase susceptibility to information input and heighten the readiness for action.

They include orienting of the sensory organs to the source of stimulation, exploratory responses, physical and chemical changes in the sense organs that facilitate greater discrimination, increases in the activation of the peripheral (e.g., muscle tone and blood pressure) and central (electroencephalogram) spheres of functioning, etc. After an orienting reaction has been triggered repeatedly, it increasingly changes from a generalized to a more specific functional activation. The avoidance reaction encompasses some similar and some distinctly different components. In contrast to the orienting reaction, it decreases susceptibility to information and protects against overstimulation. These detailed analyses of processes lasting only a few seconds are of interest not only to psychophysicologists; they are also rel-

evant to theories of motivation – the processes in question represent prototypes of “advancing” and “retreating” tendencies, which may in turn lead to approach and avoidance behavior.

Eysenck's Trait Theory Approach The English psychologist Hans Jürgen Eysenck is known primarily for his trait-oriented research in personality. His use of questionnaire methods and factor analysis was similar to R. B. Cattell's technique. Eysenck's bipolar personality continua of extraversion vs. introversion and neuroticism vs. emotional stability have become standards. According to Eysenck, individual differences along these two mutually independent dimensions are hereditary.

Eysenck (1967) combined this trait-theoretical approach with Pavlov's brain physiological model of excitation and inhibition and particularly with the approaches of Sokolov and Hebb. He was also inspired by the more recent discoveries of activating centers in the brain and the attendant explanatory models of the physiology of activation. He attributed individual differences on the extraversion-introversion dimension to differences in the activation function of the ARAS, postulating higher levels of activation for introverted individuals. Extraverts take longer to develop conditioned reflexes. He characterized the other dimension (neuroticism vs. emotional stability) as an “emotional drive” and attributed it to centers of the limbic system (where Olds had discovered what he called “reinforcement centers”). This led to a unique merger of personality theory and activation-based motivation theory, in support of which Eysenck cited data from numerous tests and experimental studies of the physiology of the brain from both the East and the West.

- Many psychophysicologists are now involved in various areas of psychophysiological research on arousal. To the extent that this research is motivation-oriented, it focuses on the influence of situational factors and the effectiveness of organismic factors, particularly specific brain mechanisms.

Figure 2.5 gives an overview of the two branches of associationist theories within the study of motivation: the learning psychology

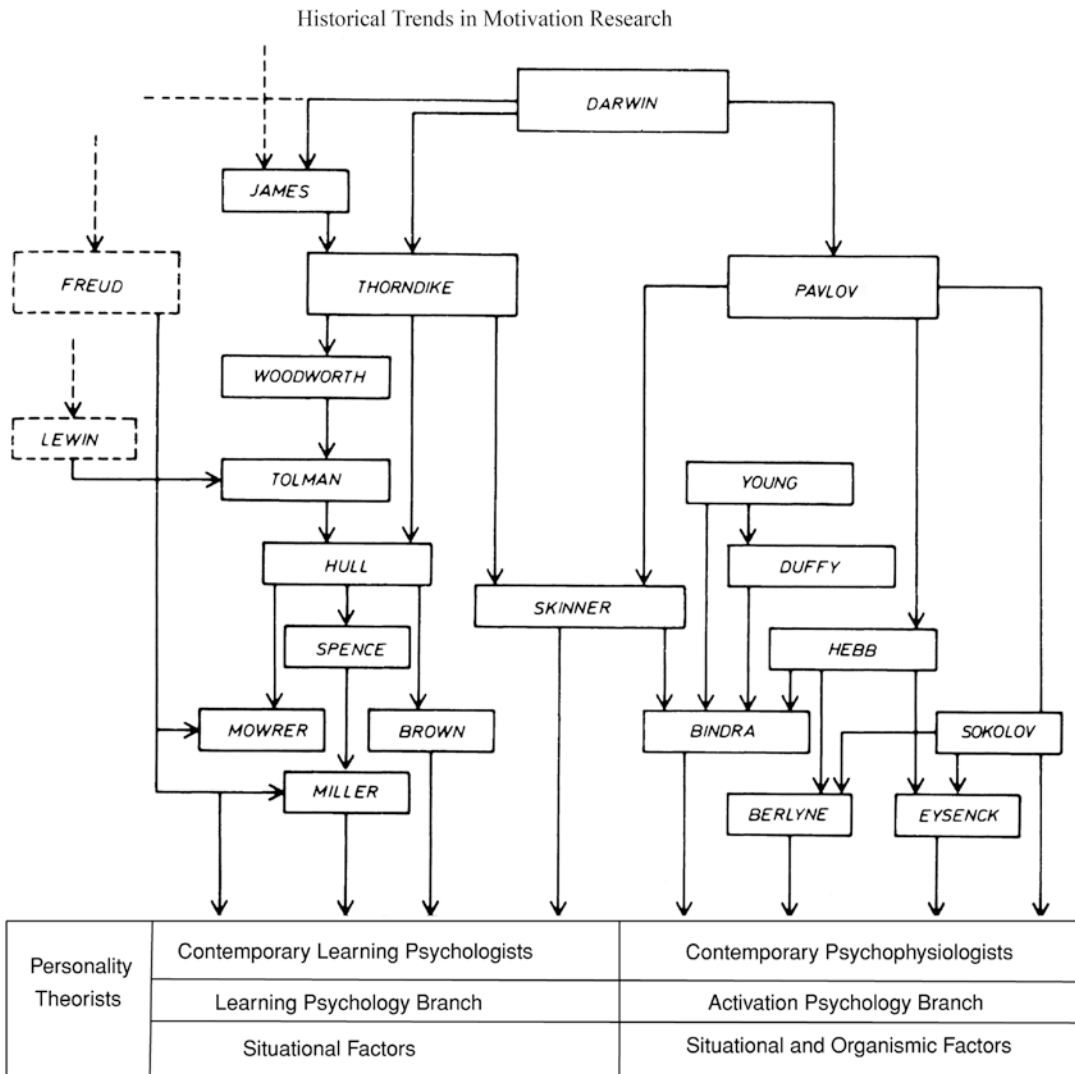


Fig. 2.5 Associationist theories in the development of motivation research

approach and the activation psychology approach. Both focus on the functional analysis of factors hypothesized to energize and guide observable behavior. Differences in behavior are explained almost exclusively in terms of situational factors, external as well as internal stimuli. Enduring (i.e., dispositional) factors are attributed to biological mechanisms, e.g., organismic homeostatic states that, if disturbed, elicit need states and thus stimulate drives, to mechanisms of the central nervous system such as the ARAS or the reinforcement centers, or to need-independent incentive characteristics of substances such as various types of food. Eysenck was the only

proponent of the associationist approach to pay much attention to person factors, i.e., individual differences in motivational dispositions (traits).

There are historical reasons for this. Issues relating to motivation were initially embedded in other theoretical questions and only gradually evolved as questions in their own right. The learning theorists' research was and is primarily focused on learning processes, i.e., on the organism's adaptation to changes in the environment. Arousal-oriented research focuses on the functional analysis of neurological and psychophysiological mechanisms of the responding organism. Both branches made extensive use of animal research. For this reason, and

because their actual strength is more easily manipulated, motivation research within the associationist strand is generally restricted to organismic needs or, more accurately, the resulting drives or “primary motives.” “Secondary,” “higher,” or “social” motives that encompass different categories of person-environment interactions were not considered at all, much less as an explanation for individual differences in motivation. Nevertheless, both branches contain some notions that point in that direction:

- Fear as a learned, secondary drive (N. E. Miller)
- Individual differences in dispositional anxiety (Spence and Taylor)
- Exploratory and epistemic behavior (Berlyne)
- Personality differences in the perception of the environment and emotional stability (Eysenck)

Summary

The historical overview provided in this chapter was intended to give readers an impression of the variety and scope of the research activities and theoretical models that relate to explanatory concepts like motive (or equivalent concepts) and motivation in one way or another. At the same time, the overview maps out the rather convoluted path that characterizes the study of motivation. The scientific study of motivation is still too young for there to have been a thorough historical analysis of the issues involved.

The subsequent chapters of this book focus more on motivational and cognitive approaches related to the psychology of motivation than on the other strands of motivation research. There are a number of reasons for this:

- These approaches reflect the interplay of influences from the other research traditions, particularly those relating to personality, cognition, and learning.
- They have produced a number of fruitful syntheses of theoretical models and methodological developments.
- They attest to the rapid development of experimental research.
- The study of “higher” human motives not only relates to all the fundamental issues of motivation research but also demonstrates a variety of approaches to these issues.
- At present, the theory and methods of these approaches are best able to respond to the demand that behavior be regarded as a process of interaction between changing situation factors and dispositional person factors.

Moreover, particular attention will be paid to volitional phenomena, an area of research that is undergoing rapid development. Undoubtedly, the study of volitional processes will play an increasingly significant role in future motivational research.

Review Questions

1. *Which research traditions can be distinguished in the history of motivation research, and who were their founders?*

- The psychology of the will: founded by Narziss Ach
- The instinct theory approach: founded by William McDougall
- Personality theories: founded by Sigmund Freud
- Associationist theories, the learning psychology approach: founded by Edward Lee Thorndike

- Associationist theories, the activation psychology approach: founded by Ivan P. Pavlov
2. *What are heterogenetic and autogenetic theories of the will?*

Heterogenetic theories of the will (e.g., Ebbinghaus, Külpe) attribute volitional phenomena to manifestations and entities beyond volition itself (e.g., muscular sensations, intellectual conclusions). These heterogenetic mechanisms were investigated using introspective methods. Autogenetic theories of the will (e.g., Wundt, James), in contrast, conceptualize volition as an independent

(continued)

entity, attributable to volitional processes and not to other manifestations.

3. *What role did Wilhelm Wundt and the members of the Würzburg school consider conscious and/or unconscious processes to play in the development and implementation of volition?*

Both conscious and unconscious processes are involved in the development and implementation of volition, with unconscious processes playing a particularly important role. For Wundt, all processes of attention, apperception, perception, thought, and memory – i.e., what we now know as information processing – were driven by volitional acts.

4. *Who founded experimental psychology, and which were the first experiments conducted?*

The founder of experimental psychology was Wilhelm Wundt; his experiments were studies of “mental chronometry.” This involved the comparison of reaction times under different experimental conditions. The difference observed (“subtractive procedure”) was used as an indicator of the complexity of certain subprocesses of the reaction.

5. *What is meant by Narziss Ach’s construct of the “determining tendency,” and what was the decisive experiment conducted in this respect?*

In both mental and motor tasks, determining tendencies below the level of conscious awareness must be at work in order for an intended goal to be implemented. In Ach’s decisive experiment to measure volitional strength (determining tendency), respondents had to overcome a strong association (between two syllables) to carry out a new instruction (a different combination of syllables). The more frequent the presentation of the original association, which now had to be overcome in order to execute the new instruction suc-

cessfully, the stronger the determining tendency was considered to be.

6. *What contribution did William McDougall’s instinct theory make to the study of motivation?*

McDougall saw instincts as inherited psychophysical dispositions that determine people to perceive, and pay attention to, objects of a certain class, and to respond to this experience with a particular quality of emotional excitement and by acting in a particular manner. In the USA, this definition paved the way for the selective study of motivational processes (the reasons for action) at the expense of research on volitional processes. McDougall’s specification of 18 motivational “propensities” inspired personality psychology (e.g., Allport, Lersch). Finally, McDougall’s concepts of instinct and propensities can be seen as direct precursors to the study of comparative behavior or ethology.

7. *What was Sigmund Freud’s contribution to contemporary motivational psychology?*

Freud focused attention on the following aspects, introducing them to the study of psychology: the decisive role of the unconscious, individual drive dynamics as determinants of behavior, and drive reduction as the mechanism underlying motivated behavior. The following assumptions proved particularly influential:

- Drive impulses become manifest in different ways.
- The id, the superego, and the ego are involved in permanent conflict.
- The adult personality is an outcome of drives and their vicissitudes in childhood.
- The psychosexual stages of drive development evolve from a three-way drama between mother, father, and child.

8. *What influence did Kurt Lewin have on the psychology of motivation?*

Lewin's theory did not focus on individual differences, but involved broader psychological principles. His construct of the "quasi need" shifted research interest away from processes of volition (Narziss Ach's "determining tendency"). Lewin explains behavior in terms of the field of psychological forces emanating from the environment and the individual at any point in time: $B = f(P, E)$. Although his model was focused on the environment, Lewin's work influenced the personality theory approach to motivation. His environmental model with its analysis of situational forces (i.e., incentives) informed incentive theories of motivation. Lewin's approach also influenced conflict theory, the theory of level of aspiration, and research on substitute activities. Many of his experimental paradigms are still in use.

9. *What are the basic premises of Vroom's instrumentality theory?*

Actions and their outcomes have consequences that are associated with positive and negative incentive values. The individual anticipates these action-outcome consequences, and this anticipation serves to motivate action. The valences associated with the positive and negative incentives can vary individually. They are multiplied by the action's instrumentality for attaining the consequences (action-outcome-consequence expectancies; see outcome-consequence expectancies in Chap. 1, Fig. 1.2) to obtain the incentive value.

10. *How does McClelland define motivation?*

Motivation is the "reintegration" by a stimulus cue of an experienced change in a certain class of affective situations (e.g., achievement situation).

11. *How does Atkinson's risk-taking model of achievement motivation represent the interaction between person and situation factors?*

$T_s = M_s \times P_s \times I_s$; the motive tendency to approach success is the product of the personal motive to achieve success, the probability of success, and the incentive value of success. This product reflects the interaction between person and situation factors: If any of the factors in the equation is equal to zero, the others will have no effect either. When all factors come together, however, the product, i.e., the motive tendency, increases substantially.

12. *What was the major impact of the cognitive psychology approach (to personality theories of motivation) on the study of motivation? Which research traditions were founded on the basis of this approach?*

The cognitive psychology approach reintroduced the concept of reason to the study of motivation, following a long period during which the field had been dominated by the concepts of drive and instinct. Cognitive processes such as beliefs, perceptions, and expectancies about the courses of action available in a given situation can motivate behavior, as can incentives. The cognitive psychology approach produced consistency theories, which state that motivated behavior is intended to avoid or resolve inconsistencies. These consistency theories include the theories of cognitive balance (Heider) and cognitive dissonance (Festinger). The theory of causal attribution (Heider, Weiner) is also an outcome of the cognitive psychology approach.

13. *What is the basic premise of associationist theories in motivation research?*

The basic idea is that behaviors that facilitate successful interaction with the environment, i.e., that have survival value,

(continued)

became associated with pleasurable feelings over the course of human evolution. Thus, behavior becomes associated with positive affect and thus becomes attractive.

14. *According to Hull, which two components determine behavior? How are these components linked?*

Hull postulates a motivational component (“drive”) and an associative (“habit”) component. The two components are multiplied to determine a behavior tendency known as the “reaction-evocation potential.”

15. *How does B. F. Skinner distinguish between operant responses and respondent behavior?*

In operant responses, behavior is reinforced by being closely followed by a desired stimulus. Behavior causes the outcome and is reinforced by it. In respondent behavior (classical conditioning), in contrast, the stimulus eliciting a particular behavior or affect becomes associated with a new stimulus, such that the new stimulus is now also able to trigger the behavior or affect in question.

References

- Ach, N. (1905). *Über die Willensätigkeit und das Denken*. Göttingen, Germany: Vandenhoeck & Ruprecht.
- Ach, N. (1910). *Über den Willensakt und das Temperament*. Leipzig, Germany: Quelle & Meyer.
- Allport, G. W. (1937). *Personality: A psychological interpretation*. New York, NY: Holt.
- Anderson, J. R. (1983). *The architecture of cognition*. Cambridge, MA: Harvard University Press.
- Angermeier, W. F., & Peters, M. (1973). *Bedingte Reaktionen*. Berlin, Heidelberg, Germany/New York, NY/Tokio, Japan: Springer.
- Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review*, *64*, 359–372.
- Atkinson, J. W. (1964). *An introduction to motivation*. Princeton, NJ: Van Nostrand.
- Atkinson, J. W. (1974a). Motivational determinants of intellectual performance and cumulative achievement. In J. W. Atkinson & J. O. Raynor (Eds.), *Motivation and achievement* (pp. 389–410). Washington, DC: Winston.
- Atkinson, J. W. (1974b). Strength of motivation and efficiency of performance. In J. W. Atkinson & J. O. Raynor (Eds.), *Motivation and achievement* (pp. 193–218). Washington, DC: Winston.
- Atkinson, J. W., & Birch, D. A. (1978). *Introduction to motivation* (2nd ed.). New York, NY: Van Nostrand.
- Atkinson, J. W., & Cartwright, D. (1964). Some neglected variables in contemporary conceptions of decision and performance. *Psychological Reports*, *14*, 575–590.
- Atkinson, J. W., & Feather, N. T. (Eds.). (1966). *A theory of achievement motivation*. New York, NY: Wiley.
- Aveling, F. (1926). The psychology of conation and will. *British Journal of Psychology*, *16*, 339–353.
- Bem, D. J., & Allen, A. (1974). Ort predicting some of the people some of the time: The search for cross-situational consistencies in behavior. *Psychological Review*, *81*, 506–520.
- Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York, NY: McGraw-Hill.
- Berlyne, D. E. (1963). Motivational problems raised by exploratory and epistemic behavior. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. V, pp. 284–364). New York, NY: McGraw-Hill.
- Berlyne, D. E. (1967). Arousal and reinforcement. In D. Levine (Ed.), *Nebraska symposium on motivation* (pp. 1–110). Lincoln, NE: University of Nebraska Press.
- Bindra, D. (1959). *Motivation: A systematic reinterpretation*. New York, NY: Ronald.
- Bindra, D. (1969). The interrelated mechanisms of reinforcement and motivation, and the nature of their influence on response. In W. J. Arnold & D. Levine (Eds.), *Nebraska symposium on motivation* (pp. 1–38). Lincoln, NE: University of Nebraska Press.
- Bindra, D. (1974). A motivational view of learning, performance, and behavior modification. *Psychological Review*, *81*, 199–213.
- Birenbaum, G. (1930). Das Vergessen einer Vornahme: Isolierte seelische Systeme und dynamische Gesamtbereiche. *Psychologische Forschung*, *13*, 218–284.
- Bolles, R. C. (1967). *Theory of motivation*. New York, NY: Harper & Row.
- Bolles, R. C. (1972). Reinforcement, expectancy, and learning. *Psychological Review*, *79*, 394–409.
- Bolles, R. C. (1974). Cognition and motivation: Some historical trends. In B. Weiner (Ed.), *Cognitive views*

- of human motivation (pp. 1–20). New York, NY: Academic.
- Bolles, R. C. (1975). *Theory of motivation* (2nd ed.). New York, NY: Harper & Row.
- Boring, E. G. (1929). *A history of experimental psychology*. New York, NY: Appleton-Century-Crofts.
- Boyce, R. (1976). In the shadow of Darwin. In R. G. Green & E. C. O'Neil (Eds.), *Perspectives in aggression* (pp. 11–35). New York: Academic Press.
- Brown, J. S. (1953). Problems presented by the concept of acquired drives. In J. S. Brown & A. Jacobs (Eds.), *Current theory and research in motivation: A symposium* (pp. 1–21). Lincoln, NE: University of Nebraska Press.
- Brown, J. S. (1961). *The motivation of behavior*. New York, NY: McGraw-Hill.
- Cattell, R. B. (1950). *Personality: A systematic, theoretical, and factual study*. New York, NY: McGraw Hill.
- Cattell, R. B. (1957). *Personality und motivation: Structure and measurement*. Yonkers, NY: World Book.
- Cattell, R. B. (1965). *The scientific analysis of personality*. Baltimore, MD: Penguin Books.
- Cattell, R. B. (1974). *Handbook of modern personality theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Cofer, C. N., & Appley, M. H. (1964). *Motivation: Theory and research*. New York, NY: Wiley.
- Darwin, C. (1859). *Origin of species by means of natural selection*. London, UK: John Murray.
- Darwin, C. (1871). *The descent of man, and selection in relation to sex*. New York, NY: Appleton.
- Dawkins, R. (1976). *The selfish gene*. New York, NY: Oxford University Press.
- Dollard, J., & Miller, N. E. (1950). *Personality and psychotherapy: An analysis in terms of learning, thinking, and culture*. New York, NY: McGraw-Hill.
- Donders, F. C. (1862). Die Schnelligkeit psychischer Prozesse. *Archiv für Anatomie und Physiologie*, 657–681.
- Duffy, E. (1932). The relationship between muscular tension and quality of performance. *American Journal of Psychology*, 44, 535–546.
- Duffy, E. (1934). Emotion: An example of the need for reorientation in psychology. *Psychological Review*, 41, 184–198.
- Duffy, E. (1941). An explanation of “emotional” phenomena without the use of the concept “emotion”. *Journal of General Psychology*, 25, 283–293.
- Duffy, E. (1962). *Activation and behavior*. New York, NY: Wiley.
- Düker, H. (1931). *Psychologische Untersuchungen über freie und zwangsläufige Arbeitsweise. Experimentelle Beiträge zur Willens- und Arbeitspsychologie*. Leipzig, Germany: Barth.
- Düker, H. (1975). *Untersuchungen über die Ausbildung des Wollens*. Bern, Switzerland: Huber.
- Ebbinghaus, H. (1902). *Abriß der Psychologie*. Leipzig, Germany: Veit.
- Edwards, W. (1954). The theory of decision-making. *Psychological Bulletin*, 51, 380–417.
- Escalona, S. K. (1940). The effect of success and failure upon the level of aspiration and behavior in manic-depressive psychoses. *University of Iowa, Studies in Child Welfare*, 16, 199–302.
- Eysenck, H. J. (1967). *The biological basis of personality*. Springfield, IL: Thomas.
- Eibl-Eibesfeldt, I. (1973). *Der vorprogrammierte Mensch [The preprogrammed human]*. Vienna, Austria: Molden.
- Eibl-Eibesfeldt, I. (1975). *Krieg und Frieden aus der Sicht der Verhaltensforschung [The biology of peace and war: Men, animals, and aggression]*. Munich, Germany: Piper.
- Eibl-Eibesfeldt, I. (1984). *Die Biologie des menschlichen Verhaltens: Grundriß der Humanethologie [The biology of human behavior: Outline of human ethology]*. Munich, Germany: Piper.
- Festinger, L. (1942). A theoretical interpretation of shifts in level of aspiration. *Psychological Review*, 49, 235–250.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row Peterson.
- Festinger, L. (1964). *Conflict, decision, and dissonance*. Stanford, CA: Stanford University Press.
- Freud, S. (1895). Letters to Wilhelm Fliess. In S. Freud, M. Bonaparte, A. Freud, & E. Kris (Eds.), (1954) *The origins of psycho-analysis: Letters to Wilhelm Fliess, drafts and notes: 1887–1902* (pp. 347–445). New York: Basic Books.
- Freud, S. (1925a). *Die Traumdeutung. (GW, Bd. II–III, 1900)*. Frankfurt, Germany: Fischer.
- Freud, S. (1925b). *Hemmung, Symptom, Angst. (GW, Bd. XIV, 1926)*. Frankfurt, Germany: Fischer.
- Freud, S. (1925c). *Trieb- und Triebchicksale. (GW, Bd. X, 1915)*. Frankfurt, Germany: Fischer.
- Halisch, F., & Heckhausen, H. (1977). Search for feedback information and effort regulation during task performance. *Journal of Personality and Social Psychology*, 35, 724–733.
- Hamilton, W. D. (1964). The genetical evolution of social behavior. *Journal of Theoretical Biology*, 7, 17–52.
- Harris, B. (1979). Whatever happened to little Albert? *American Psychologist*, 34, 151–160.
- Hartshorne, H., & May, M. A. (1928). *Studies in the nature of character. Vol. 1: Studies in deceit*. New York, NY: Macmillan.
- Hebb, D. O. (1949). *The organization of behavior*. New York, NY: Wiley.
- Hebb, D. O. (1953). Heredity and environment in mammalian behavior. *British Journal of Animal Behavior*, 1, 43–47.
- Heckhausen, H. (1963). Eine Rahmentheorie der Motivation in zehn Thesen. *Zeitschrift für Experimentelle und Angewandte Psychologie*, 10, 604–626.
- Heckhausen, H. (1972). Die Interaktion der Sozialisationsvariablen in der Genese des Leistungsmotivs. In C. F. Graumann (Ed.), *Handbuch*

- der Psychologie (Bd. 7/2, S. 955–1019). Göttingen, Germany: Hogrefe.
- Heckhausen, H. (1977a). *Achievement motivation and its constructs: A cognitive model, Motivation and Emotion*. (1, 4 (pp. 283–329). New York, NY: Plenum.
- Heckhausen, H. (1977b). Motivation: Kognitionspsychologische Aufspaltung eines summarischen Konstrukts. *Psychologische Rundschau*, 28, 175–189.
- Heckhausen, H. (1978). Selbstbewertung nach erwartungswidrigem Leistungsverlauf: Einfluß von Motiv, Kausalattribution und Zielsetzung. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, 10, 191–216.
- Heckhausen, H. (1980). *Motivation und Handeln*. Heidelberg, Germany: Springer.
- Heckhausen, H. (1982). The development of achievement motivation. In W. W. Hartup (Ed.), *Review of child development research* (pp. 600–668). Chicago, IL: University of Chicago Press.
- Heckhausen, H. (1987). Vorsatz, Wille und Bedürfnis: Lewins frühes Vermächtnis und ein zugeschnittener Rubikon. In H. Heckhausen, P. M. Gollwitzer, & F. E. Weinert (Eds.), *Jenseits des Rubikon: Der Wille in den Humanwissenschaften* (pp. 86–96). Berlin, Germany: Springer.
- Heckhausen, H., & Gollwitzer, P. M. (1987). Thought contents and cognitive functioning in motivational versus volitional states of mind. *Motivation and Emotion*, 11, 101–120.
- Heckhausen, H., & Kuhl, J. (1985). From wishes to action: The dead ends and short cuts on the long way to action. In M. Frese & L. Sabini (Eds.), *Goal-directed behavior: Psychological theory and research on action* (pp. 134–160., 367–395). Hillsdale, NJ: Erlbaum.
- Heckhausen, H., Schmalt, H.-D., & Schneider, K. (1985). *Achievement motivation in perspective*. New York, NY: Academic.
- Heider, F. (1946). Attitudes and cognitive organization. *Journal of Psychology*, 21, 107–112.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York, NY: Wiley. (deutsch 1977: Psychologie der interpersonalen Beziehungen. Stuttgart: Klett).
- Heider, F. (1960). The gestalt theory of motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 145–172). Lincoln, Germany: University of Nebraska Press.
- Helson, H. (1948). Adaptation level as a basis for a quantitative theory of frames of reference. *Psychological Review*, 55, 297–313.
- Hillgruber, A. (1912). Fortlaufende Arbeit und Willensbetätigung. *Untersuchungen zur Psychologie und Philosophie*, 1, 6.
- Hoppe, F. (1930). Untersuchungen zur Handlungs- und Affektpsychologie. IX. Erfolg und Mißerfolg. *Psychologische Forschung*, 14, 1–63.
- Hull, C. L. (1930). Knowledge and purpose as habit mechanisms. *Psychological Review*, 37, 511–525.
- Hull, C. L. (1943). *Principles of behavior*. New York, NY: Appleton-Century-Crofts.
- Hull, C. L. (1952). *A behavior system: An introduction to behavior theory concerning the individual organism*. New Haven, CT: Yale University Press.
- Hess, E. H. (1962). Ethology. In T. M. Newcomb (Ed.), *New directions in psychology* (Vol. I). New York: Holt, Rinehart and Winston.
- Hinde, R. A. (1974). The study of aggression: Determinants, consequences, goals, and functions. In J. de Wit & W. W. Hartup (Eds.), *Determinants and origins of aggressive behavior* (pp. 3–27). The Hague, Netherlands: Mouton.
- Irwin, F. W. (1971). *Intentional behavior and motivation. A cognitive theory*. Philadelphia, PA: Lippincott.
- James, W. (1890). *The principles of psychology* (Vol. 2). New York, NY: Holt.
- Jones, E. E., & Davis, K. E. (1965). From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2, pp. 219–266). New York, NY: Academic.
- Jucknat, M. (1938). Leistung, Anspruchsniveau und Selbstbewußtsein. *Psychologische Forschung*, 22, 89–179.
- Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska symposium on motivation* (pp. 192–238). Lincoln, Germany: University of Nebraska Press.
- Kleinbeck, U. (1975). *Motivation und Berufswahl*. Göttingen, Germany: Hogrefe.
- Koch, S. (Ed.). (1959–1963). *Psychology: A study of a science*. New York, NY: McGraw-Hill.
- Krantz, D. L., & Allan, D. (1967). The rise and fall of McDougall's instinct doctrine. *Journal of the History of the Behavioral Sciences*, 3, 326–338.
- Krug, S. (1976). Förderung und Änderung des Leistungsmotivs: Theoretische Grundlagen und deren Anwendung. In H.-D. Schmalt & W.-U. Meyer (Eds.), *Leistungsmotivation und Verhalten* (pp. 221–247). Stuttgart, Germany: Klett.
- Kuhl, J. (1977). *Miß- und prozeßtheoretische Analysen einiger Person- und Situationsparameter der Leistungsmotivation*. Bonn, Germany: Bouvier.
- Kuhl, J. (1978a). Situations-, reaktions- und personbezogene Konsistenz des Leistungsmotivs bei der Messung mittels des Heckhausen TAT. *Archiv für Psychologie*, 130, 37–52.
- Kuhl, J. (1978b). Standard setting and risk preference: An elaboration of the theory of achievement motivation and an empirical test. *Psychological Review*, 85, 239–248.
- Kuhl, J. (1982). The expectancy-value approach in the theory of social motivation. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 125–162). Hillsdale, NJ: Erlbaum.
- Kuhl, J. (1983). *Motivation, Konflikt und Handlungskontrolle*. Berlin, Germany: Springer.

- Külpe, O. (1893). *Grundriß der Psychologie. Auf experimenteller Grundlage dargestellt*. Leipzig, Germany: Wilhelm Engelmann.
- Lange, L. (1888). Neue Experimente über den Vorgang der einfachen Reaktion auf Sinneseindrücke. *Philosophische Studien*, 4, 479–510.
- Lehmann, H. C., & Witty, P. A. (1934). Faculty psychology and personality traits. *American Journal of Psychology*, 46, 486–500.
- Lersch, P. (1938). *Aufbau des Charakters*. Leipzig, Germany: Barth.
- Lewin, K. (1926). Untersuchungen zur Handlungs- und Affekt-Psychologie, II.: Vorsatz, Wille und Bedürfnis. *Psychologische Forschung*, 7, 330–385.
- Lewin, K. (1931). Environmental forces in child behavior and development. In C. Murchison (Ed.), *Handbook of child psychology* (pp. 94–127). Worcester, MA: Clark University Press.
- Lewin, K. (1936). *Principles of topological psychology*. New York, NY: McGraw-Hill.
- Lewin, K. (1963). *Feldtheorie in den Sozialwissenschaften*. Bern, Switzerland: Huber.
- Lewin, K., Dembo, T., Festinger, L., & Sears, P. S. (1944). Level of aspiration. In J. McHunt (Ed.), *Personality and the behavior disorders* (Vol. 1, pp. 333–378). New York, NY: Ronald.
- Lindsley, D. B. (1957). Psychophysiologie and motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 44–105). Lincoln, NE: University of Nebraska Press.
- Lindworsky, J. (1923). *Der Wille: Seine Erscheinung und seine Beherrschung* (3rd ed.). Leipzig, Germany: Barth.
- Lissner, K. (1933). Die Entspannung von Bedürfnissen durch Ersatzhandlungen. *Psychologische Forschung*, 18, 218–250.
- Locke, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance*, 3, 157–189.
- Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice Hall.
- Lorenz, K. (1937). Über die Bildung des Instinkt-begriffs. *Naturwissenschaften*, 25, 289–331.
- Lorenz, K. (1943). Die angebotenen Formen möglicher Erfahrung. *Zeitschrift für Tierpsychologie*, 5, 235–409.
- Lorenz, K. (1950). The comparative method of studying innate behavior patterns. In Society for Experimental Biology (Ed.), *Physiological mechanisms in animal behavior, Symposium Nr. 4* (pp. 221–268). New York, NY: Academic.
- Lorenz, K. (1966). Ethologie, die Biologie des Verhaltens [Ethology, the biology of behavior]. In F. Gessner & L. V. Bertalanffy (Eds.), *Handbuch der Biologie* (Vol. II, pp. 341–559). Frankfurt, Germany: Athenäum.
- Madsen, K. B. (1959). *Theories of motivation*. Copenhagen, Denmark: Munksgaard.
- Madsen, K. B. (1974). *Modern theories of motivation*. Copenhagen, Denmark: Munksgaard.
- Mahler, W. (1933). Ersatzhandlungen verschiedenen Realitätsgrades. *Psychologische Forschung*, 18, 27–89.
- Maslow, A. H. (1954). *Motivation and personality*. New York, NY: Harper.
- McClelland, D. C. (1951). *Personality*. New York, NY: Holt, Rinehart & Winston.
- McClelland, D. C. (1953). *The achievement motive (s. auch 1976)*. New York, NY: Appleton-Century-Crofts (Irvington/Wiley).
- McClelland, D. C. (1961). *The achieving society*. Princeton, NJ: Van Nostrand.
- McClelland, D. C. (1965). N achievement and entrepreneurship: A longitudinal study. *Journal of Personality and Social Psychology*, 1, 389–392.
- McClelland, D. C. (1971). *Assessing human motivation*. New York, NY: General Learning.
- McClelland, D. C. (1975). *Power: The inner experience*. New York, NY: Irvington.
- McClelland, D. C. (1978). Managing motivation to expand human freedom. *American Psychologist*, 33, 201–210.
- McClelland, D. C. (1985). How motives, skills, and values determine what people do. *American Psychologist*, 41, 812–825.
- McClelland, D. C., & Winter, D. G. (1969). *Motivating economic achievement*. New York, NY: Free.
- McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motive*. New York, NY: Appleton-Century-Crofts.
- McDougall, W. (1908). *An introduction to social psychology*. London, UK: Methuen.
- McDougall, W. (1932). *The energies of men*. London, UK: Methuen.
- McGuire, W. J. (1966). The current status of cognitive consistency theories. In S. Feldman (Ed.), *Cognitive consistency* (pp. 1–46). New York, NY: Academic.
- Meumann, E. (1908/1913). *Intelligenz und Wille* [Intelligence and volition]. Leipzig, Germany: Quelle & Meyer.
- Meyer, W.-U. (1973). Anstrengungsintention in Abhängigkeit von Begabungseinschätzung und Aufgabenschwierigkeit. *Archiv für Psychologie*, 125, 245–262.
- Meyer, W.-U. (1976). Leistungsorientiertes Verhalten als Funktion von wahrgenommener eigener Begabung und wahrgenommener Aufgabenschwierigkeit. In H.-D. Schmalt & W.-U. Meyer (Eds.), *Leistungsmotivation und Verhalten* (pp. 101–135). Stuttgart, Germany: Klett.
- Michotte, A. E. (1954). *Autobiographie. Extrait de Psychologica Belgia*. Louvain, Belgium: Editions Nauwelaerts.
- Michotte, A. E. (1912). Note à propos de contributions recentes à la psychologie de la volonté. *Études de Psychologie*, 1, 193–233.

- Michotte, A. E., & Prüm, E. (1910). Étude expérimentale sur le choix volontaire et ses antécédents immédiats. *Archives de Psychologie*, 10, 119–299.
- Mierke, K. (1955). Wille und Leistung. Göttingen, Germany: Hogrefe.
- Miller, N. E. (1944). Experimental studies of conflict. In J. M. V. Hunt (Ed.), *Personality and the behavioral disorders* (Vol. I, pp. 431–465). New York, NY: Ronald.
- Miller, N. E. (1948). Studies of fear as an acquirable drive. Fear as motivation and fear-reduction as reinforcement in the learning of new responses. *Journal of Experimental Psychology*, 38, 89–101.
- Miller, N. E. (1951). Learnable drives and rewards. In S. S. Stevens (Ed.), *Handbook of experimental psychology* (pp. 435–472). New York, NY: Wiley.
- Miller, N. E. (1959). Liberalization of basic S-R concepts: Extensions to conflict behavior, motivation, and social learning. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. II, pp. 196–292). New York, NY: McGraw-Hill.
- Miller, N. E. (1963). Some reflections on the law of effect produce a new alternative to drive reduction. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 65–112). Lincoln, NE: University of Nebraska Press.
- Miller, N. E., & Dollard, J. (1941). *Social learning and imitation*. New Haven, CT: Yale University Press.
- Mischel, T. (1970). Wundt and the conceptual foundations of psychology. *Philosophical and Phenomenological Research*, 31, 1–26.
- Moruzzi, G., & Magoun, H. W. (1949). Brain stem reticular formation and activation of the EEG. *EEG and Clinical Neurophysiology*, 1, 455–473.
- Mowrer, H. O. (1939). A stimulus-response analysis of anxiety and its role as a reinforcing agent. *Psychological Review*, 46, 553–565.
- Mowrer, H. O. (1960). *Learning theory and behavior*. New York, NY: Wiley.
- Müller, G. E., & Pilzecker, A. (1900). *Experimentelle Beiträge zur Lehre vom Gedächtnis*. Leipzig, Germany: Barth.
- Münsterberg, H. (1888). *Die Willenshandlung. Ein Beitrag der physiologischen Psychologie*. Freiburg, Germany: Moler.
- Murray, H. A. (1938). *Explorations in personality*. New York, NY: Oxford University Press.
- Neumann, J., & Morgenstern, O. (1944). *Theory of games and economic behavior*. Princeton, NJ: Princeton University Press.
- Norman, D. A. (1980). Twelve issues for cognitive science. *Cognitive Science*, 4, 1–32.
- Olds, J. (1955). Physiological mechanisms of reward. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (Vol. 47, pp. 73–139). Lincoln, NE: University of Comparative Physiological Psychology. 419–427.
- Olds, J. (1969). The central nervous system and the reinforcement of behavior. *American Psychologist*, 24, 114–132.
- Olds, J., & Milner, P. (1954). Positive reinforcement produced by electrical stimulation of septal area and other regions of rat brain. *Journal of Comparative and Physiological Psychology*, 47, 419–427.
- Ovsiankina, M. (1928). Die Wiederaufnahme unterbrochener Handlungen. *Psychologische Forschung*, 11, 302–379.
- Pavlov, I. P. (1927). *Conditioned reflexes*. London, UK: Oxford University Press.
- Peak, H. (1955). Attitude and motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 149–189). Lincoln, NE: University of Nebraska Press.
- Pfänder, A. (1911). Motive und motivation. In A. Pfänder (Ed.), *Münchener Philosophische Abhandlungen (Festschrift für Theodor Lipps)* (pp. 163–195). Leipzig, Germany: Barth.
- Piaget, J. (1936). *Le naissance de l'intelligence chez l'enfant*. Neuchatel, Switzerland: Delachaux et Nestlé.
- Rapaport, D. (1959). The structure of psychoanalytic theory: A systematizing attempt. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. III, pp. 55–183). New York, NY: McGraw-Hill.
- Rapaport, D. (1960). On the psychoanalytic theory of motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 173–247). Lincoln, NE: University of Nebraska Press.
- Raynor, J. O. (1969). Future orientation and motivation of immediate activity: An elaboration of the theory of achievement motivation. *Psychological Review*, 76, 606–610.
- Rheinberg, F. (1980). *Leistungsbewertung und Lernmotivation*. Göttingen, Germany: Hogrefe.
- Scheffer, D., Kuhl, J. (2003). Der Operante Motiv-Test (OMT): Inhaltsklassen, Auswertung, psychometrische Kennwerte und Validierung. In J. Stiensmeier-Pelster (Ed.), *Tests und Trends: N.F.2. Diagnostik von Motivation und Selbstkonzept* (pp. 151–168). Göttingen u.a.: Hogrefe
- Schmalt, H.-D. (1976). *Die Messung des Leistungsmotivs*. Göttingen, Germany: Hogrefe.
- Schmalt, H.-D. (1979). Leistungsthematische Kognitionen. II: Kausalattributionen, Erfolgserwartungen und Affekte. *Zeitschrift für Experimentelle und Angewandte Psychologie*, 26, 509–531.
- Schneider, K. (1973). *Motivation unter Erfolgsrisiko*. Göttingen, Germany: Hogrefe.
- Sechenov, I. (1968). The reflexes of brain. In I. Sechenov (Ed.), *Selected works, Medizinsky Vestnik (1863)* (pp. 263–336). Amsterdam, Netherlands: Bonset.
- Selz, O. (1910). Die experimentelle Untersuchung des Willensaktes. *Zeitschrift für Psychologie*, 57, 241–270.
- Selz, O. (1913). *Über die Gesetze des geordneten Denkverlaufs*. Stuttgart, Germany: Spemann.
- Skinner, B. F. (1935). Two types of a conditional reflex and a pseudotype. *Journal of General Psychology*, 12, 66–77.
- Skinner, B. F. (1938). *The behavior of organisms: An experimental approach*. New York, NY: Appleton-Century.
- Skinner, B. F. (1953). *Science and human behavior*. New York, NY: Macmillan.
- Skinner, B. F. (1968). *The technology of teaching*. New York, NY: Appleton-Century-Crofts.

- Sokolov, E. N. (1958). *Vospriiate i uslovny refleks*. Moscow, Russia: University of Moscow Press. (russ.)
- Sokolov, E. N. (1963). *Perception and the conditioned reflex*. New York, NY: Macmillan.
- Spence, K. W. (1956). *Behavior theory and conditioning*. New Haven, CT: Yale University Press.
- Spence, K. W. (1960). *Behavior theory and learning: Selected papers*. Englewood Cliffs, NJ: Prentice-Hall.
- Stern, W. (1935). *Allgemeine Psychologie auf personalistischer Grundlage*. Den Haag, Netherlands: Nijhoff.
- Taylor, J. A. (1953). A personality scale of manifest anxiety. *Journal of Abnormal and Social Psychology*, 48, 285–290.
- Taylor, J. A., & Spence, K. W. (1952). The relationship of anxiety level to performance in serial learning. *Journal of Experimental Psychology*, 44, 61–64.
- Thomae, H. (Ed.). (1965). *Handbuch der Psychologie. Allgemeine Psychologie II: Motivation*. Göttingen, Germany: Hogrefe.
- Thorndike, E. L. (1898). Animal intelligence: An experimental study of associative processes in animals. *Psychological Review Monographs Supplement*, 5, 551–553.
- Thorndike, E. L. (1911). *Animal intelligence*. New York, NY: Macmillan.
- Tolman, E. C. (1932). *Purposive behavior in animals and men*. New York, NY: Appleton-Century.
- Toman, W. (1960). On the periodicity of motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 80–96). Lincoln, NE: University of Nebraska Press.
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, 46, 35–57.
- Trudewind, C. (1975). *Häusliche Umwelt und Motiventwicklung*. Göttingen, Germany: Hogrefe.
- Tinbergen, N. (1951). *The study of instinct*. London: Oxford University Press.
- Vroom, V. H. (1964). *Work and motivation*. New York, NY: Wiley.
- Watson, J. B., & Rayner, R. (1920). Conditioned emotional responses. *Journal of Experimental Psychology*, 3, 1–14.
- Watt, H. J. (1905). Experimentelle Beiträge zu einer Theorie des Denkens. *Archiv für die Gesamte Psychologie*, 4, 289–436.
- Weiner, B. (1972). *Theories of motivation*. Chicago, IL: Markham.
- Weiner, B. (1974). *Achievement motivation and attribution theory*. Morristown, NJ: General Learning.
- Weiner, B. (1980). A cognitive (attribution) – emotion – action model of motivated behavior: An analysis of judgments of help-giving. *Journal of Personality and Social Psychology*, 39, 186–200.
- Weiner, B., Heckhausen, H., Meyer, W.-U., & Cook, R. E. (1972). Causal ascriptions and achievement behavior: A conceptual analysis of effort and reanalysis of locus of control. *Journal of Personality and Social Psychology*, 21, 239–248.
- Winter, D. G. (1996). *Personality: Analysis and interpretation of lives*. New York, NY: McGraw-Hill.
- Woodworth, R. S. (1918). *Dynamic psychology*. New York, NY: Columbia University Press.
- Wundt, W. (1874). *Grundzüge der physiologischen Psychologie*. Leipzig, Germany: Engelmann.
- Wundt, W. (1894). Über psychische Causalität und das Princip des psychophysischen Parallelismus. *Philosophische Studien*, 10, 1–124.
- Wundt, W. (1896). *Grundriß der Psychologie*. Leipzig, Germany: Engelmann.
- Yerkes, R. M., & Morgulis, S. (1909). The method of Pavlov in animal psychology. *Psychological Bulletin*, 6, 257–273.
- Young, P. T. (1941). The experimental analysis of appetite. *Psychological Bulletin*, 38, 129–164.
- Young, P. T. (1959). The role of affective processes in learning and motivation. *Psychological Review*, 66, 104–125.
- Young, P. T. (1961). *Motivation and emotion. A survey of the determinants of human and animal activity*. New York, NY: Wiley.
- Zajonc, R. B. (1968). Cognitive theories in social psychology. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (Vol. I, 2nd ed.). Reading, MA: Addison-Wesley.
- Zeigarnik, B. (1927). Über das Behalten von erledigten und unerledigten Handlungen. *Psychologische Forschung*, 9, 1–85.