RELEARNING METHOD

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1. Core Definition

The Relearning Method, often referred to synonymously as the **Method of Savings**, is a fundamental technique in the study of human and animal memory designed to measure the quantity of forgotten material that remains available in the memory system, even when it cannot be consciously recalled or recognized. This method assesses retention indirectly by quantifying the reduction in effort, time, or trials required to reacquire previously learned information after a significant retention interval. Essentially, it operates on the principle that if learning occurred previously, the process of acquiring the material a second time will be significantly faster and more efficient than the initial learning phase, assuming the underlying memory trace has not completely decayed. The difference between the original effort and the subsequent relearning effort provides a measurable index of memory retention, known formally as the savings score.

This approach is particularly valuable because it can detect residual memory traces that are too weak to register on conventional explicit memory tests, such as free recall or cued recall tasks. When a subject states they have completely forgotten a specific body of knowledge, the Relearning Method offers an objective means to determine if this knowledge is merely inaccessible, rather than entirely absent. The core utility lies in its sensitivity; it is considered the most rigorous measure of retention available, capable of revealing latent learning effects. The material may have slipped below the threshold for conscious retrieval, but the neural pathways established during the initial learning phase remain partially intact, evidenced by the relative ease of restoration.

The application of the Relearning Method typically involves three distinct stages: the initial learning phase, where the time or trials required to reach a specific performance criterion are meticulously recorded; the retention interval, which is a period during which no practice or exposure to the material occurs, allowing natural forgetting to take place; and the relearning phase, where the subject attempts to master the material again, with the time or trials needed to achieve the original mastery level being measured. The comparison of the data from the first and third stages yields the critical savings score, which is a direct quantification of how much learning was "saved" from the loss associated with the retention interval.

2. Etymology and Historical Development

The conceptual foundation of the Relearning Method is inextricably linked to the pioneering work of German psychologist Hermann Ebbinghaus, who first formalized the technique in his seminal 1885 treatise, *Über das Gedächtnis* (On Memory). Ebbinghaus sought to bring rigorous scientific

methodology to the study of memory, a field previously dominated by philosophical speculation. Recognizing the inherent difficulty in measuring forgetting objectively, he invented both the technique and the materials necessary for its application, namely the use of consonant-vowel-consonant (CVC) trigrams, or "nonsense syllables," to minimize the influence of prior associations and meaning.

Ebbinghaus used himself as the sole subject for his extensive experiments, laboriously memorizing lists of these nonsense syllables until he could recall them perfectly. After varying retention intervals--ranging from minutes to weeks--he would rememorize the same lists, recording the precise number of repetitions or the time required for this subsequent mastery. It was Ebbinghaus who first observed and quantified the critical finding that less effort was always needed for relearning, even when he could not consciously recall a single syllable. This reduction in effort was termed "savings," establishing the Relearning Method as the first reliable quantitative tool in experimental psychology for charting the precise curve of forgetting, demonstrating that memory loss is most rapid immediately after learning and then plateaus over time.

The historical significance of Ebbinghaus's development of the Method of Savings cannot be overstated. By demonstrating that memory could be studied experimentally and mathematically, he provided the critical empirical foundation upon which modern cognitive psychology and memory research are built. His focus on rigorous, quantifiable measurement--specifically through the savings score--set the standard for subsequent generations of experimental psychologists studying learning and retention, providing a methodology that addressed the challenge of measuring internal cognitive processes through external behavioral data.

3. Key Concepts and Components

Savings Score Calculation: The savings score is the most critical metric derived from the Relearning Method. It is typically expressed as a percentage, calculated by taking the difference between the initial learning time (or trials) and the relearning time (or trials), dividing this difference by the initial learning time, and multiplying by 100. The resulting percentage represents the amount of original learning retained. For example, if it took 10 minutes to learn a list initially and 4 minutes to relearn it, the savings score is 60%, indicating that 60% of the memory trace was retained despite the interval.

Latent Memory Measurement: The method specializes in measuring **latent memory**, or memory traces that exist below the threshold of conscious access. Unlike recall or recognition tests, which rely on the active retrieval of information, the Relearning Method detects implicit retention. A high savings score in the absence of explicit recall strongly suggests that the information is available within the memory system but is temporarily inaccessible to conscious processes.

Criterion of Mastery: For the method to be valid, the learning criterion--the standard used to

determine when the subject has successfully mastered the material in both the initial and relearning phases--must be identical. This ensures that the comparison between the original learning effort and the subsequent relearning effort is fair and accurate. If the criterion for mastery differs (e.g., five perfect repetitions initially versus three perfect repetitions upon relearning), the resulting savings score will be fundamentally flawed as a measure of retention.

4. Applications and Experimental Examples

The Relearning Method is highly versatile and has been applied across various domains of memory research, serving as a powerful tool in both human and animal studies. One classic application cited in introductory texts involves animal learning experiments, such as teaching laboratory animals like rats to navigate complex mazes. In such studies, the rat is initially trained to run the maze until it achieves a fixed criterion (e.g., reaching the reward location without error for three consecutive trials). After a period of enforced rest or non-practice, allowing the procedural memory of the maze path to fade, the rat is subjected to relearning.

The observation that rats typically require significantly fewer trials or less time to regain the mastery level demonstrates a measurable savings score, confirming that the spatial and procedural knowledge was not completely expunged from memory. This methodology is crucial for studying the biological underpinnings of habituation and procedural learning, allowing researchers to correlate the rate of forgetting with neurophysiological changes or the effects of experimental interventions, such as lesioning specific brain regions or administering pharmacological agents hypothesized to affect memory consolidation.

In human memory research, while Ebbinghaus famously used nonsense syllables, the method is readily adapted to complex materials like foreign language vocabulary, poetry, mathematical formulas, or lists of paired associates. For instance, a student may spend five hours initially memorizing a long list of historical dates. If, six months later, they spend only two hours to achieve the same level of mastery, the relearning method quantifies a 60% savings. This application highlights the method's utility in real-world educational psychology, demonstrating that even fragmented or seemingly forgotten knowledge provides a significant advantage in subsequent restudy efforts, confirming the long-term persistence of educational effects.

5. Cognitive Implications and Nature of Forgetting

The results derived from the Relearning Method have profound implications for understanding the fundamental processes of memory storage and retrieval, particularly regarding the nature of **forgetting** itself. By consistently detecting savings even when explicit memory tests yield zero recall, the method supports the idea that forgetting is often a problem of retrieval failure rather than storage decay. This distinction--between the availability of a memory trace and its accessibility--is

a cornerstone of cognitive theory. The memory trace, or the structural change in the brain representing the learned material, remains available; however, the necessary cues or pathways required to access that trace may temporarily become non-functional.

Furthermore, the Relearning Method was instrumental in validating the existence of the Ebbinghaus forgetting curve, which describes the exponential rate at which retention decreases over time. This established a quantitative law of memory, indicating that the greatest proportion of forgetting occurs rapidly following initial learning, a fact that has driven pedagogical and psychological interventions aimed at optimizing review schedules and minimizing initial memory decay. The savings score provides the most sensitive measure of the position on this curve, offering a precise index of how much the memory has weakened over a specific interval.

The consistent demonstration of savings underscores the efficiency of the human memory system, suggesting that once an association or piece of information is encoded, the neural infrastructure supporting it resists complete obliteration. The relearning process is essentially the rehabilitation and strengthening of existing, albeit weakened, neural connections, which is significantly less demanding than building those connections from scratch. This cognitive efficiency speaks to the adaptive nature of memory, prioritizing the rapid restoration of previously relevant knowledge over entirely novel acquisition.

6. Limitations and Modern Criticisms

Despite its foundational role, the Relearning Method is subject to certain methodological limitations and criticisms, particularly when viewed through the lens of modern memory research. One major limitation stems from its inherently labor-intensive and time-consuming nature. To establish a reliable savings score, researchers must rigorously measure the time or trials for both the initial learning and the subsequent relearning phases, often involving multiple sessions and lengthy retention intervals, which can make large-scale studies impractical.

A second significant criticism revolves around the limited ecological validity of the original technique. Ebbinghaus's reliance on nonsense syllables, while ensuring experimental control by stripping away meaning and prior knowledge, represents a highly artificial form of learning. Critics argue that memory processes involving meaningful, context-rich information, such as autobiographical or semantic memory, may not adhere strictly to the laws derived from rote memorization measured by the savings score. The method is best suited for assessing rote, serial, or procedural memory, and its utility diminishes when examining complex, relational, or episodic memory retrieval.

Finally, modern neuroscience techniques, such as functional Magnetic Resonance Imaging (fMRI) and electroencephalography (EEG), offer direct, real-time measurements of brain activity during encoding and retrieval, providing insights into memory traces that the behavioral Relearning

Method cannot access. While the savings score reveals that memory exists, it does not explain *how* or *where* that memory is stored, nor does it differentiate between various types of forgetting (e.g., decay versus interference). Consequently, while the Relearning Method remains historically and conceptually vital, contemporary memory research often supplements or replaces it with neuroscientific tools that offer greater explanatory power regarding the mechanisms underlying retention.

Further Reading

Hermann Ebbinghaus (Wikipedia)
Forgetting Curve (Wikipedia)
Memory Basics (Psychology Today)