Third Order Conditioning

Authored by

mohammad looti

October 8, 2025

RECOMMENDED CITATION

mohammad looti (2025). *Third Order Conditioning*. PSYCHOLOGICAL SCALES. Retrieved from https://scales.arabpsychology.com/?p=35956

ARABPSYCHOLOGY.COM

Third Order Conditioning

Primary Disciplinary Field(s): Psychology, Classical Conditioning, Behaviorism

1. Core Definition

Third Order Conditioning (TOC) is a specialized concept within the framework of Classical Conditioning, often studied in the context of Higher Order Conditioning (HOC). It describes a complex learning sequence where an organism learns to associate a conditioned response (CR) with a third, previously neutral stimulus (NS3) through repeated pairings, even though this third stimulus has never been directly associated with the original Unconditioned Stimulus (UCS). This process represents the third degree of separation from the primary biological reinforcement source, illustrating the remarkable ability of learned associations to propagate through subsequent neutral stimuli.

Fundamentally, TOC relies upon the strength of the preceding Second Order Conditioning (SOC). For TOC to successfully occur, the organism must first establish a robust association between the UCS and the first Conditioned Stimulus (CS1), and then between CS1 and the second Conditioned Stimulus (CS2). Once CS2 reliably elicits the CR, it temporarily acquires the reinforcing properties necessary to condition a third stimulus (CS3). However, this conditioning is inherently fragile and ephemeral, as the learned response weakens logarithmically with each successive step away from the original biologically salient stimulus (UCS).

2. Etymology and Historical Development

The foundation for understanding Third Order Conditioning lies in the pioneering work of Ivan Pavlov in the early 20th century, specifically concerning his experiments on canine digestion and salivation. While Pavlov's initial documentation focused primarily on what is now termed First Order Conditioning (the direct association between the UCS--food--and the CS1--a tone), subsequent research by his colleagues and later behaviorists recognized the possibility of extending these associations. The concept of Higher Order Conditioning emerged to describe instances where conditioning occurred without the direct presentation of the UCS.

Classical behaviorism, particularly in the mid-20th century, sought to determine the limits of associative learning. Researchers were keen to discover how far removed a stimulus could be from the primary reinforcer while still eliciting a response. While Second Order Conditioning quickly became a standard, demonstrable phenomenon in laboratory settings, the existence and reliability of Third Order Conditioning proved far more contentious. Early experimental designs often failed to produce stable TOC, leading to debates regarding whether such associations were true conditioning or merely transient sensory-sensory pairings that quickly underwent extinction. The consensus maintains that while possible, TOC represents the theoretical threshold of effective

ARABPSYCHOLOGY.COM

classical association.

3. Mechanism: The Conditioning Hierarchy

Understanding Third Order Conditioning necessitates reviewing the progressive steps of the conditioning hierarchy, moving from primary biological relevance to increasingly abstract association. The standard model often uses the Pavlovian procedure involving salivation, as outlined in the source content.

The sequence begins with **First Order Conditioning**. Here, a biologically relevant Unconditioned Stimulus (UCS), such as food, naturally elicits an Unconditioned Response (UCR), such as salivation. A neutral stimulus (NS1, e.g., a tone) is consistently paired immediately before the UCS. After repeated pairings, the NS1 becomes the Conditioned Stimulus (CS1), eliciting the Conditioned Response (CR) of salivation on its own. This initial stage establishes the fundamental emotional or physiological link.

The process advances to **Second Order Conditioning**. In this stage, the newly established CS1 (the tone) is paired with a new neutral stimulus (NS2, e.g., a light). Crucially, the original UCS (food) is no longer presented. The association is purely between two learned stimuli. If successful, the NS2 becomes the CS2 (the light), capable of eliciting the CR (salivation), though this response is measurably weaker than the response to CS1.

Finally, **Third Order Conditioning** occurs when the CS2 (the light) is paired with yet another neutral stimulus (NS3, e.g., a buzzer). Again, neither the CS1 nor the UCS is presented during this stage. The conditioned stimulus from the second order association (CS2) serves as the temporary "reinforcer" for the NS3. If learning successfully takes place, the NS3 becomes the CS3 (the buzzer), capable of eliciting a conditioned response. This response, while present, is exceedingly weak and highly susceptible to extinction because of its remote connection to the primary biological drive provided by the food.

4. Key Characteristics

Diminution of Response Intensity: The most salient feature of TOC is the profound diminution of the conditioned response (CR) intensity. While CRs produced by first-order conditioning are robust and reliable, the CR elicited by the CS3 is often barely detectable, requiring precise measurement techniques to confirm its existence. This weakness reflects the fact that the CS3 is three steps removed from the primary biological significance of the Unconditioned Stimulus.

High Vulnerability to Extinction: Third order associations are critically dependent on the maintenance of the preceding associations. If the CS3 is presented repeatedly without the subsequent pairing of the CS2, the conditioned response quickly dissipates. Furthermore, if the underlying CS1-UCS association is extinguished, the entire hierarchy collapses rapidly. This

ARABPSYCHOLOGY.COM

fragility means that successful demonstrations of TOC usually require very specific, controlled laboratory settings with brief intervals between conditioning steps.

Theoretical Limit of Associative Learning: TOC often serves as the theoretical and practical limit of how far an association can be extended through stimulus substitution. It highlights that while learned stimuli can temporarily function as reinforcers, they quickly lose the necessary motivational salience required for stable, long-lasting conditioning after the second or third step.

5. Applications and Significance

Although pure Third Order Conditioning is rare and difficult to stabilize experimentally, the overarching concept of Higher Order Conditioning, which encompasses TOC, holds significant theoretical and practical importance in psychology. HOC models are crucial for understanding how complex emotional responses, such as phobias, anxieties, and generalized fears, develop far beyond the initial traumatic or aversive event. For instance, if an individual develops a phobia (CR) to flying (CS1) after a turbulent experience (UCS), they might then associate the anxiety with airports (CS2) and subsequently with anything related to travel planning (CS3), even though the planning stage itself is entirely benign.

Furthermore, HOC is central to fields like Marketing and Advertising. Advertisers often employ SOC and TOC principles by pairing their product (NS3) not directly with primary rewards (UCS), but with highly positive secondary conditioned stimuli (CS2) already established in popular culture, such as successful celebrities, aspirational lifestyles, or emotionally resonant music. The goal is to transfer the positive emotional valence (CR) from the CS2 to the product (CS3), thereby fostering a subtle, conditioned preference. The complexity of human social and economic life means that many secondary reinforcers--such as money, status symbols, and academic grades--acquire their potent motivational power through deep, high-order associations with primary drives like security and sustenance.

6. Debates and Criticisms

The academic viability of robust, stable Third Order Conditioning has faced substantial debate within experimental psychology. The primary criticism revolves around the difficulty in definitively isolating TOC from related, but distinct, phenomena such as Sensory Preconditioning. Sensory preconditioning occurs when two neutral stimuli (NS2 and NS3) are paired *before* either is associated with the UCS, which differs mechanistically from the step-by-step reinforcement required by HOC, and can sometimes yield results that mimic TOC.

Many researchers argue that what appears to be stable TOC may often be better explained by an enhanced sensitivity to the CS2 rather than a truly learned association with the CS3. Due to the inherent weakness of the resulting CR, the conclusion is often drawn that TOC represents the

ARABPSYCHOLOGY.COM

functional limit of the classical conditioning paradigm. After the second order, the conditioned stimulus simply lacks the motivational salience required to act as a genuine substitute for the UCS, resulting in transient or statistically unreliable learning outcomes that are difficult to replicate outside highly specialized laboratory environments.

Further Reading

Classical conditioning (Wikipedia)
Higher-order conditioning (Wikipedia)
Second-order conditioning (Wikipedia)
Behaviorism (Wikipedia)

ARABPSYCHOLOGY.COM