SECONDARY CIRCULAR REACTION

Authored by

mohammad looti

October 14, 2025

SECONDARY CIRCULAR REACTION

Primary Disciplinary Field(s): Psychology (Developmental Psychology; Cognitive Development)

1. Core Definition

The Secondary Circular Reaction (SCR) is a fundamental cognitive-behavioral pattern described by **Jean Piaget** within the framework of his Theory of Cognitive Development. It characterizes the behavior of infants during the third substage of the Sensorimotor Period, typically occurring between 4 and 8 months of age. The SCR represents a crucial developmental shift, marking the point where the infant's attention and activity move away from self-centered bodily functions and reflexes (as seen in Primary Circular Reactions) toward the manipulation and interaction with the external environment.

A SCR is initiated when an infant performs an action, usually discovered by chance, that produces an interesting or satisfying outcome in the world outside their body. For example, the infant might accidentally knock a mobile hanging over their crib, causing it to swing and make noise. The reaction is termed "circular" because, finding the result pleasurable or stimulating, the infant subsequently repeats the action in a deliberate and sustained manner solely for the purpose of reproducing the initial, desired external effect. This sustained repetition of a newly acquired behavior pattern aimed at prolonging an external spectacle is the hallmark of the secondary circular reaction.

Crucially, while the infant demonstrates **intent** to cause things to occur and sustain them, the action pattern itself is still relatively inflexible. At this stage, the action is tied directly to the specific circumstances under which it was first successful. The infant repeats the exact motion that yielded the result previously, demonstrating a burgeoning sense of environmental causality but lacking the ability to adapt this action (the means) to achieve the same result in a slightly different context or to apply the action to a novel problem. This focus on reproducing an effect on objects distinguishes it sharply from earlier stages and establishes the foundation for future, more complex forms of instrumental behavior.

2. Theoretical Context: Piaget's Sensorimotor Stage

Piaget structured the Sensorimotor Stage (birth to approximately 2 years) into six distinct substages, each defined by the complexity of the child's motor actions and their interaction with sensory input. The Secondary Circular Reactions substage (Substage 3) is a vital transition point, linking the initial, reflexive behaviors of the first two stages to the truly intentional and coordinated schemes that emerge later. Prior to this stage, behavior is dominated by involuntary reflexes (Substage 1) and simple habits focused on the body (Substage 2). The establishment of the SCR signifies the infant's entry into a phase where the world becomes an object of interest and

manipulation.

The transition into Substage 3 involves a critical shift in the infant's understanding of the relationship between means and ends. In Substage 2, the actions were ends in themselves (e.g., thumb sucking is satisfying simply because it is happening). In Substage 3, the action (e.g., kicking the mattress) becomes a **means** to an external end (e.g., making the mobile swing). Although the initial means-end relationship is accidental--the infant does not plan the action ahead of time--the subsequent, deliberate repetition confirms that the infant is beginning to grasp the concept of instrumentality and the practical influence they can exert on their surroundings. This move away from purely somatic actions toward object-oriented actions is foundational for the development of object permanence and spatial reasoning.

This substage also reflects the gradual de-centering of the infant's perspective. Through repeated manipulation of objects--shaking, dropping, hitting--the infant gathers empirical data about the properties of these external entities. This active engagement contrasts sharply with the passive reception of the environment characteristic of earlier life. The SCR effectively serves as the infant's first systematic experimentation, albeit limited, providing crucial data that informs the development of schemas related to physical objects, movement, sound, and simple mechanical causality. This accumulated experience forms the necessary prerequisite for the coordination of schemes that will define Substage 4, where true, premeditated goal-directed actions first appear.

3. Key Characteristics and Mechanics

The mechanics of the Secondary Circular Reaction involve several defining features related to **intentionality**, focus, and flexibility. Firstly, the focus of the action must be **exteroceptive**; that is, directed outward toward an object or event in the environment. This distinguishes it from primary reactions, which are purely interoceptive or proprioceptive.

Secondly, the SCR is characterized by **reiteration for maintenance**. The infant's goal is not to solve a novel problem but merely to repeat an action that has already yielded a satisfying result. The action sequence (Scheme A) is used to maintain the pleasurable sensory outcome (Spectacle B). The pleasure derived is secondary--the enjoyment of the spectacle itself--rather than primary--the mere satisfaction of the action's execution. This drive to reproduce the spectacle is often observed through behaviors that frequently cause laughter or high interest in the infant, such as repeatedly shaking a toy or batting at a mirror reflection.

Thirdly, and critically, the SCR is still primarily **non-adaptive**. While the infant shows intent to repeat, if the environment changes, the infant fails to modify the means to achieve the end. For instance, if the mobile is moved slightly out of reach, the infant will continue to kick the original location of the crib rail rather than attempt a new motor scheme (like reaching or crawling) to compensate for the distance. The action pattern is therefore rigid and limited to the originally

successful context. This lack of functional adaptation means that the SCRs are not yet true intentional problem-solving behaviors but rather successful, learned habits related to external environmental effects.

The SCR also reveals an early form of generalized intentionality. Once an infant successfully uses one SCR (e.g., shaking a rattle), they may attempt to apply that same shaking scheme to entirely inappropriate objects, such as a soft pillow or a bottle, simply because the scheme itself has become a generalized tool for interacting with the world. This overgeneralization demonstrates the infant's developing understanding that their actions are powerful, even if they lack the cognitive subtlety to differentiate which schemes are appropriate for which specific objects.

4. Distinctions from Other Reactions

Understanding the Secondary Circular Reaction necessitates comparing it to the two other major circular reactions described by Piaget: the Primary and the Tertiary.

The **Primary Circular Reaction** (PCR, Substage 2, 1-4 months) is fundamentally body-centered. PCRs involve the coordination of two body schemes, such as coordinating the sight of the hand with the act of grasping, or the repeated sucking of the thumb. These actions are performed because the physical sensation itself is intrinsically satisfying. There is no external goal; the actions are purely self-referential and focused on refining the infant's basic physiological coordination. In contrast, the SCR is fundamentally **object-focused** and driven by the effect produced outside the infant's physical boundaries.

The **Tertiary Circular Reaction** (TCR, Substage 5, 12-18 months) marks the peak of sensorimotor experimentation. While the SCR is repetitive (performing Action A multiple times to achieve Result B), the TCR is **varied repetition**. The infant systematically modifies the action (A1, A2, A3...) to see how the result (B1, B2, B3...) changes. This is the stage of the "little scientist," where true novelty and active adaptation emerge. For example, an infant in the SCR stage repeatedly hits a drum the same way; an infant in the TCR stage hits the drum with their hand, then with a spoon, then scrapes it gently, deliberately exploring different means to produce varied effects. This capacity for variation and exploration in the TCR highlights the rigidity inherent in the SCR.

The developmental trajectory moves from the reflexive, self-contained world of the PCR, through the externalized but repetitive world of the SCR, and finally to the exploratory and adaptive world of the TCR. The SCR is thus the critical intermediary step where the infant first acknowledges the external environment as an interactive playground, but has not yet developed the cognitive flexibility required to invent truly novel solutions or understand complex causal chains.

5. Significance in Cognitive Development

The emergence of Secondary Circular Reactions is a watershed moment in the infant's cognitive life, serving as the essential bedrock for later intellectual achievements. It represents the psychological birth of **objective causality**. By repeating an action that produces an effect, the infant begins to construct the understanding that there is a dependable link between their behavior and changes in the environment, moving past an early, more magical or diffused sense of causality.

Furthermore, the SCR contributes significantly to the development of **object permanence**. By interacting repeatedly with objects that disappear (e.g., batting at a toy that swings out of view and then back), the infant solidifies the knowledge that objects exist independently of their immediate perception. The SCR provides empirical data for object existence, even if the infant in this stage still lacks the ability to actively search for hidden objects (a skill that emerges in Substage 4).

Most importantly, the SCR is the first clear indication of **non-reflexive intentionality**. While the intent is focused on repetition rather than novel problem-solving, it demonstrates a conscious effort to sustain a desired state of affairs. This intent lays the essential groundwork for the subsequent substage, the Coordination of Secondary Schemes (Substage 4), where the infant learns to coordinate two previously separate SCRs into a sequence (e.g., using scheme A to remove an obstacle, in order to apply scheme B to reach a toy), marking the beginning of genuine, premeditated problem-solving behavior.

6. Further Reading

Sensorimotor Stage (Wikipedia)
Piaget's Theory of Cognitive Development (Simply Psychology)
The Sensorimotor Stage and Circular Reactions (Verywell Mind)