A qualitative comparative research design grounded in the theory of biological processing rhythms (Holdaway, 1979; Miner, 1903) described oral reading behaviors in different levels of beginning early readers during oral reading of texts of increasing difficulty. Spectrographic analysis with waveform data triangulated with running record data, Slosson Oral Reading Tests (SORT-R3) (Slosson & Nicholson, 1990) and transcriptions allowed an in-depth analysis into the behaviors. Three research questions guided the analysis: (1) How do biological processing rhythms operate with different levels of beginning readers? (2) How do biological processing rhythms, as examined through waveforms of oral reading behavior, operate as beginning readers read texts of increasing difficulty? (3) What happens when an interruption occurs in the biological processing rhythm? Internal independent indicators and external dependent indicators were revealed. The findings demonstrated that when an interruption to the processing rhythm occurs and an unsuccessful self-correction follows, the rhythm deteriorates. Conversely, when an interruption to the processing rhythm occurs, readers integrate language, motor, and perceptual information to meet the challenge, which leads to restored or improved processing rhythms. Based on the findings from the research, a model of processing rhythms in beginning readers emerged. The model offers a new lens for understanding changes in reading behavior and the role of texts for promoting reading efficiency.