Fetal Alcohol Spectrum Disorders (FASD) can manifest as deficits in cognitive behaviors including executive function, learning, and memory. Working memory subserves many aspects of executive function and its capacity increases during adolescence, a time of development and refinement of prefrontal cortices. The cholinergic system, including projections that innervate the prefrontal cortex, plays a crucial role in attention, as well as learning and memory processes. Thus, we propose that treatment with choline during adolescence will improve working memory at that time and that a combination of choline and working memory training during adolescence will improve cognitive flexibility in young adulthood. To test this prediction, offspring of animals exposed to an ethanol-containing or control liquid diet during gestation were given intraperitoneal injection of choline or saline between postnatal day (P)16 and P30. Working memory was tested/trained during adolescence using a delayed non-matching to place task. In young adulthood, cognitive flexibility was tested in the same animals using the attentional set shifting task. Sequential phases of the task require identification of stimulus dimension(s) that vary to predict a correct response. As the task progresses, dimensions change and success relies on flexible use of the stimulus dimensions or "sets". Animals then underwent resting state functional magnetic resonance imaging (rsfMRI) to determine effects of ethanol and treatment on functional connectivity.