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TITLE: How Many Levels Do Players Reason? An Observational Challenge and Solution

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How can a researcher identify the number of levels of reasoning undertaken by players in a game? We focus on the case where the researcher cannot observe players' beliefs. Instead, the researcher has access to data which serve as a signal of the players' strategies. In the case of simultaneous-move games, standard results relate levels of reasoning to rounds of elimination of dominated strategies and, thereby, allow the researcher to partition the data to answer this question. However, in extensive-form games, levels of reasoning cannot be directly related to elimination of conditionally dominated strategies. The main theorem of this paper shows how to solve the researcher's inference problem in extensive-form games.