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# Children's ability to infer beliefs and desires from emotional reactions

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**Abstract:** Children can recover beliefs from knowledge of an agent's actions and desires, or desires from her actions and beliefs. However, both beliefs and desires are sometimes unknown and underdetermined by agents' actions. Here we ask how emotional expressions might support mental-state inferences that are otherwise ambiguous given agents' actions. We present two experiments, showing that children (mean: 5.9 years) can infer beliefs and desires simultaneously from change or stability in the valence of emotional expressions between when agents expect and observe outcomes. However, children did not infer that surprised expressions indicated false beliefs, or the absence of surprise, true beliefs, in the context of joint belief-desire reasoning. Rather they inferred that positively valenced responses to outcomes indicate true beliefs and negative responses indicated false beliefs. We propose that emotional expressions support rational inferences about mental states, consistent with the expectation that agents act on their desires given their (probabilistic) beliefs.