

# Low Reward Responsiveness at age 16 Predicts Onset of Depression During 9 Years of Follow-up

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## Background

- Evidence that depressed individuals tend to be less responsive to rewards than healthy individuals;
- Preliminary evidence based on small samples that low reward responsiveness marks vulnerability for depression.

## Research Question

**Do reduced attention toward expected reward and increased disengagement from expected reward at age 16 predict onset of depression between age 16 and age 25?**

## Method

Data were collected in a population-based sample of the TRacking Adolescents' Individual Lives Survey (TRAILS).

Modification of attention by reward expectancies was assessed at age 16 by the Spatial Orienting Task (SOT).

Depression was assessed retrospectively at age 19 by the Composite International Diagnostic Interview (CIDI) and at age 25 by the Lifetime Depression Assessment Self-report (LIDAS).

Inclusion criteria: completion of reward task at age 16, no prior onset of depression, and completion of CIDI at age 19 and/or LIDAS at age 25.

Analyses: logistic regression analyses, 1-sided tests, adjusted for SES, gender and age at time SOT.

Predictors: Z-standardized RTs of engagement to reward versus nonreward and disengagement from reward versus nonreward; automatic & voluntary trials

## Spatial Orienting Task Example Trial

Step	Duration	Description	Sequential computer screens		
1	200ms	2 vertical black bars mark the location of cues and targets			
2	250ms	Fixation score in between 2 bars		0	
3	250ms (short-delay trial)	Cue arrow replaces left or right bar (blue cue = high chance of reward at cued location; red cue = low chance of reward at cued location)		0	↓
4	Reaction time (RT)	Target (small vertical gray rectangle, 0.08 x 0.24 cm) appears - press 'b' as fast as possible if you see target, no target: don't press button	↓	0	↓
5	500ms after response	Black bars are reinstated and the feedback arrow appears (blue = response was fast enough; red = response was too slow)		0 ↑	
6	after 250 ms delay	Total score is updated		10	

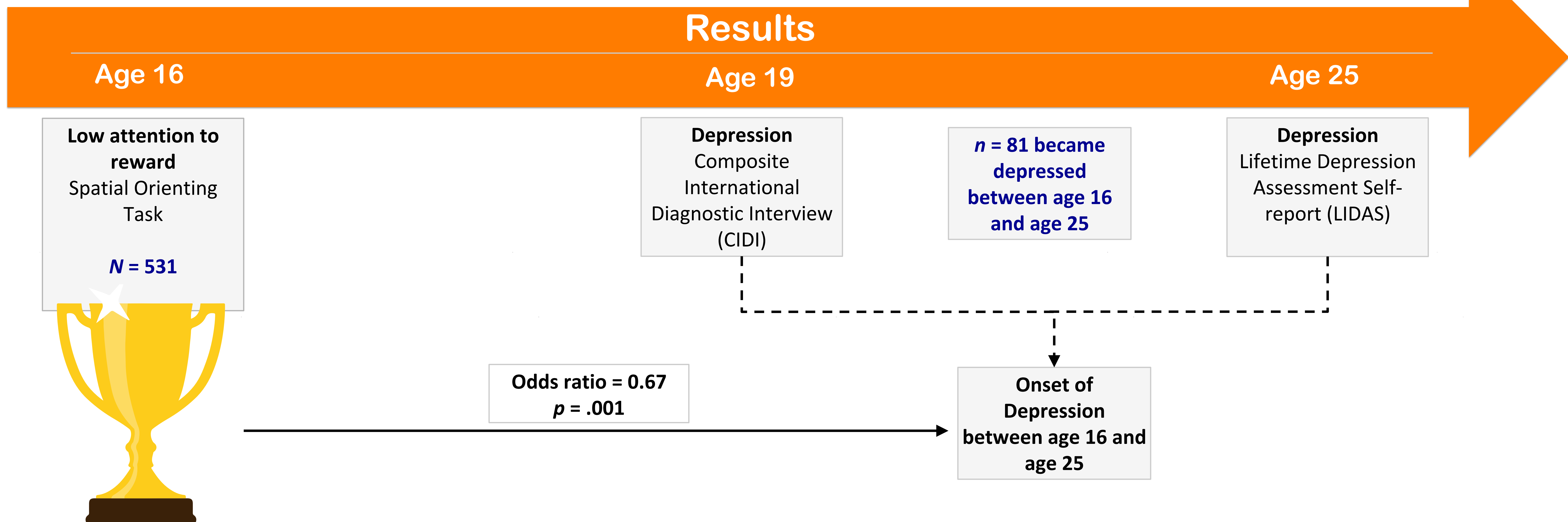
## Main Findings & Discussion

Increased disengagement from reward at age 16 predicted depression during follow-up. (only found at an automatic level of information processing)

Posthoc analysis: those who later developed depression particularly showed difficulties in shifting attention from expected nonreward to expected reward at age 16.

**Findings suggest that vulnerability to depression is not characterised by problems with engaging in rewarding situations per se, but by incapability to let go of negative situations and redirect attention to situations that may potentially be rewarding.**

**It may be useful to target low reward responsiveness in at risk adolescents, with a particular focus on redirecting attention from negative to positive situations.**



This study was published in March 2019 in the *Journal of the American Academy of Child & Adolescent Psychiatry* and is available at:

<https://doi.org/10.1016/j.jaac.2018.06.009> (open access)

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