



# Research Week 2023

## Higher prenatal dietary glycemic index predicts greater subjective and objective negative affect in six-month-old infants: a prospective longitudinal study

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### Keywords

developmental programming, glycemic control, nutrition, prenatal diet, temperament

### Abstract

The dietary glycemic index (GI) reflects the rate of post-prandial plasma glucose generation, with higher GI foods rapidly increasing blood sugar. Consumption of high-GI foods during pregnancy has been linked to offspring risk for obesity and metabolic disorders, but the independent effects of high dietary GI on infant neurodevelopment have not been clarified in the context of birthing parent metabolic health. We examined the relationship of birthing parent dietary GI, insulin resistance, and adiposity during pregnancy on infant negative affect, an early marker of neurodevelopmental risk. Subjects were 302 birthing parent-infant dyads. Assessments during the second and third trimesters included: birthing parent dietary quality (three 24-hour dietary recalls/trimester), adiposity (air displacement plethysmography), and insulin sensitivity (the homeostatic model assessment for insulin resistance (HOMA-IR) was calculated from fasting plasma glucose and insulin concentrations). At six months old, infant temperament was evaluated using subjective (Infant Behavior Questionnaire-Revised) and objective measures (Still Face paradigm). Auxiliary variables, including birthing parent race, ethnicity, parity, and age, were self-reported and mood was captured using the Center for Epidemiological Studies Depression Scale. Structural equation models accounting for the interdependence of dietary GI, adiposity, and insulin sensitivity during each trimester, and adjusted for covariates, showed that higher HOMA-IR values in the second, but not the third trimester, predicted higher objective infant negative affect at six months ( $\beta = .237, p = .0001$ ). Conversely, higher dietary GI during the third, but not the second, trimester predicted higher subjective ( $\beta = .121, p = .040$ ) and objective infant negative affect ( $\beta = .121, p = .043$ ). These results suggest that birthing parent insulin sensitivity and dietary quality may be important targets for improving infant neurodevelopment. Given its modifiable nature, interventions with a particular focus on reducing high GI food intake during the later stages of pregnancy may be most effective.