EXECUTIVE FUNCTION (EF) refers to self-regulatory skills used to navigate the challenges inherent in day-to-day life, including situations in which we are not affectively neutral (Miyake & Friedman, 2012). Cognitive load theory suggests that moods uniformly impair EF due to competition for limited cognitive resources. Conversely, mood-as-information theory suggests that negative (but not positive) mood facilitates the kinds of EF that require close attention to detail because it cues threat and thus engenders a more analytic processing style. Research findings have been inconsistent (e.g., Mitchell & Phillips, 2007), suggesting that other factors may moderate the influence of mood on EF. Because high-reactive individuals spend more time in negative mood states than their low-reactive counterparts (Nock et al., 2008), we present data from two studies in which emotional reactivity was examined as a potential moderator of mood-EF associations.

STUDY 1
OBJECTIVE & HYPOTHESES: To explore whether emotional reactivity moderated the relationship between positive and negative mood with working memory and response inhibition, widely regarded as core executive skills (Miyake & Friedman, 2012). Predictions were as follows:
- High negative mood would predict worse EF task performance for those low in reactivity (per cognitive load theory) but better EF task performance for those high in reactivity (per mood-as-information theory).
- High positive mood would predict worse EF task performance irrespective of reactivity level (consistent with both theories).

METHOD & RESULTS: Ninety-six undergraduates (Mage = 19.8 years, 66% female) completed self-report measures, including the Positive and Negative Affect Schedule, Emotion Regulation Questionnaire, and Emotion Reactivity Scale, and three computerized measures each of working memory and response inhibition, in a 90-minute session. Results were as follows:
- Inhibition was predicted by the interplay of negative mood and emotional reactivity (β = -.37, p < .001). Inhibitory performance trended towards improvement with increasing negative mood for high-reactive individuals (t = 1.81, p = .07) but showed the opposite pattern for low-reactive individuals (t = 2.84, p = .006) (bottom left).
- Working memory also was predicted by the interplay of negative mood and emotional reactivity (β = -.26, p = .18). A similar pattern to the above was observed for low-reactive individuals (t = 2.81, p = .006), but high-reactive individuals (bottom right).
- No significant main effects or interactions involving positive mood and EF task performance (ps > .10).

CONCLUSIONS: Emotional reactivity moderated the association of negative mood and EF in the manner that was predicted: negative mood was detrimental to EF task performance for low-reactive individuals, but beneficial for high-reactive individuals. These findings suggest that negative mood facilitates the application of executive skills requiring an analytic mindset, provided that it does not place demands on cognitive resources (i.e., individuals in whom negative mood is affectively ‘normal’).

STUDY 2
OBJECTIVE & HYPOTHESES: Because Study 1 examined naturally occurring variations in mood using a correlational research design, Study 2 was undertaken in an effort to replicate our initial findings using an experimental mood manipulation. It was expected that high-reactive individuals would perform better than low-reactive individuals on an EF task when negative mood was experimentally induced.

METHOD & RESULTS: One-hundred four undergraduates (Mage = 20.0 years, 70% female) were randomized to a mood induction condition in which they reflected for 5-mins on a positive or negative event whilst listening to mood-congruent music. Participants then completed the Stop Signal task, a well-validated measure of response inhibition that was also used in Study 1. Positive and negative mood ratings were obtained using a visual analog scale administered at baseline, post-induction, and post-task. Results were as follows:
- A manipulation check confirmed no significant group differences in mood at baseline, but positive mood increased following the positive mood induction [F(1, 99) = 56.80, p < .001] and negative mood increased following the negative mood induction [F(1, 92) = 55.76, p < .001].
- A model predicting Stop Signal reaction time (SSRT) as a function of mood induction condition, emotional reactivity, and their interaction was statistically significant [R² = .08, F(3, 98) = 2.74, p = .047], with the latter emerging as a significant predictor (β = 21, p = .036).
- Performance did not vary with reactivity level in the positive condition (β = .08, p = .85). In the negative condition, inhibitory performance improved with increasing level of reactivity (β = -1.27, p = .02).

CONCLUSIONS: Our findings, replicated in two studies, indicate that negative mood may help or hinder EF task performance depending one’s level of emotional reactivity. Emotional reactivity may reflect what is affectively ‘normal’ at the level of the individual and thus indicate the extent that negative mood places demands on cognitive resources that are required to effectively engage EF.

FUTURE DIRECTIONS: It future work, it would be useful to directly examine whether different thinking styles mediate the influence of positive and negative mood states on EF performance, including tasks that require close attention to detail as well as those that require more fluency.

REFERENCES: