CORRIGENDUM

Externalizing behavior severity in youths with callous–unemotional traits corresponds to patterns of amygdala activity and connectivity during judgments of causing fear—CORRIGENDUM

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Figure 1 in the original online article contained a program artifact. The entire page containing the corrected figure is re-printed herein. We regret this error and any problems it may have caused.

Reference


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analyses, and to confirm results are significant when activity is confined to the amygdala, we used an anatomically defined left amygdala mask, created using the AFNI Talairach Atlas, to extract parameter estimates for amygdala blood oxygen level dependent (BOLD) activity during judgments of causing fear. The results of a multiple regression analysis in SPSS with ICU scores entered as a continuous predictor of amygdala BOLD activity, while controlling for age and IQ, confirmed that across all participants (n = 35), CU traits are predictive of decreased amygdala activity when evaluating causing others fear, t (34) = −2.02, p = .05. We repeated these analyses including only youths with elevated conduct problems and without medication or increased movement (n = 18) and again confirmed that the negative association between CU traits and amygdala activity, when evaluating causing others fear, persists even within this subset, t (17) = −2.63, p = .02.

**CU traits, amygdala activity, and externalizing behaviors.** We next examined the relationship between externalizing behaviors and amygdala hypoactivation during judgments of causing others fear. Again, we used an anatomically defined left amygdala mask to extract parameter estimates. Externalizing behavior scores were derived from the externalizing behaviors subscale of the CBCL. The results of a regression analysis found that, when considered in isolation, increased externalizing behaviors predicted decreased amygdala BOLD activity during judgments of causing others fear, while controlling for age and IQ. This effect held both across all youths (n = 35), t (34) = −2.09, p = .05, and among only youths with elevated conduct problems (n = 18), t (17) = −2.94, p = .01.

Next, CU traits were examined as a moderator of the relationship between externalizing behaviors and amygdala BOLD activity. In AFNI, we conducted a whole-brain full factorial multiple regression analysis with externalizing behaviors, CU traits, and the interaction between the two (while controlling for age and IQ) as predictors of amygdala activity during judgments of causing fear (Table 3). The results revealed a significant interaction between externalizing behaviors and CU traits in the left amygdala across all subjects (n = 35; xyc = −22, −7, −16, k = 10, t = −3.28) such that CU traits significantly moderated the relationship between externalizing behaviors and amygdala activity. As CU traits increased, the relationship between externalizing behaviors and amygdala hypoactivation during judgments of causing fear increased in magnitude. Moreover, the inclusion of the interaction between externalizing behaviors and CU traits resulted in a significant increase in explained variance of amygdala BOLD activity, ΔR² = .57, F (1, 29) = 14.38, p < .001, confirming again that CU traits are a significant moderator of the relationship between externalizing behaviors and amygdala activity during the task, t (34) = −3.63, p = .001.

We applied the Johnson–Neyman technique (Johnson & Neyman, 1936) to identify the ICU score at which the simple slope of amygdala BOLD activity, regressed on externalizing behavior problems, differs from zero. The results revealed that the relationship between externalizing behaviors and reduced amygdala activity was only significant at or above an ICU score of 47.29, t (34) = −2.05 (Figure 2). Follow-up analyses restricted to only youths with conduct problems (n = 18) found nearly identical results. Among these youths, the relationship between externalizing behaviors and amygdala BOLD activity was moderated by CU traits, t (17) = −2.70, p = .02, with the relationship between externalizing behaviors and amygdala activity only significant at or above an ICU score of 47.84, t (17) = −2.18, p = .05.

The externalizing subscale of the CBCL comprises three subscales: attention problems, rule-breaking behaviors, and...