CORRIGENDUM

Cortisol profiles: A test for adaptive calibration of the stress response system in maltreated and nonmaltreated youth—CORRIGENDUM

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Elana B. Gordis and her affiliation were mistakenly omitted in the original version of this paper, and the acknowledgment of grant funding was also incomplete. The first page of the article is herein reprinted with these omissions inserted. We regret these errors and any problems they may have caused.

Reference

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Abstract

Throughout the life span, exposure to chronic stress such as child maltreatment is thought to contribute to future dysfunction of the stress response system (SRS) through the process of adaptive calibration. Dysfunction of the SRS is associated with numerous health and behavior problems, so it is important to understand under what conditions and what time frame adaptive calibration occurs. The present study tested for adaptive calibration of the SRS in a sample of maltreated ($n = 303$) and nonmaltreated ($n = 151$) youth during the important developmental period of adolescence. Data were used from Waves 2, 3, and 4 of a larger study of the consequences of maltreatment on health and well-being. At each time point, participants underwent the Trier Social Stress Test for Children and provided a baseline and four poststressor saliva samples to measure cortisol reactivity. Adaptive calibration was tested by performing a latent profile analysis using the five samples of salivary cortisol provided at each time point, and testing whether maltreatment status predicted the likelihood of profile membership at Time 2, Time 3, and Time 4. Three cortisol profiles emerged from the data at each time point (blunted, moderate, and elevated), and results indicated that maltreated youth were more likely than nonmaltreated youth to present with the blunted cortisol profile compared to the moderate and elevated profiles at Time 2 and Time 3, even after controlling for recent exposure to violence and trauma. At Time 4, there was no longer a difference in profile membership between maltreated and nonmaltreated youth, suggesting adaptive calibration may be a lengthy process requiring a period of years to become evident. Overall, the findings provide support for adaptive calibration and offer insight into the conditions under which adaptive calibration occurs.

Starting in utero, the progression through development is marked with a myriad of challenges or stressors that shape an individual's behavioral and physiological relationship with the social and physical environment. This relationship is ongoing; individuals are constantly interacting with their environment by absorbing and processing new information in order to formulate appropriate physiological and behavioral responses to stress (McEwen, 2007). Over time, the process of allostasis, or adapting to stress (Sterling & Eyer, 1988) via repeated activation of the stress response system (SRS), is thought to deleteriously influence individuals' physiological responses to future stressors leading to dysfunction (i.e., hypo- or hyperactivity) of the SRS. Both hypo- and hyperactivity of the SRS have alarming implications for health. Dysfunction of the SRS is associated with health problems, including depression and obesity (for review, see Tsigos & Chrousos, 2002). As a result of repeated cycles of allostasis and dysfunction of the SRS, allostatic load (AL) accumulates,

manifesting as pathological outcomes including cardiovascular disease and autoimmune disease (McEwen, 1998). One underlying tenet of AL is that the consequences of chronic activation on SRS function are cumulative (McEwen, 2000a, 2000b); however, up until recently (McEwen, Gray, & Nasca, 2015), there has been no discussion on whether the damaging effects of repeated cycles of allostasis (e.g., chronic stress) on functioning of the SRS are reversible as indicated by adaptation of the SRS. In order to better understand the potential for reversibility of SRS dysfunction as a result of chronic stress, the adaptive calibration model (ACM; Del Giudice, Ellis, & Shirtcliff, 2011) is considered.

The ACM is one theory that explains individual differences in functioning of the SRS and suggests that adaptive calibration of the SRS takes place to meet the demands of a particular environment while considering the cost to fitness (for review, see Del Giudice et al., 2011). The ACM postulates that through adaptive calibration of the SRS, individuals will display one of four SRS patterns: sensitive (moderate basal activity, high reactivity), buffered (moderate basal activity, high reactivity), vigilant (moderate to high basal activity, high reactivity), or unemotional (low basal activity, low reactivity). The four SRS patterns describe individuals' basal functioning and reactivity of the SRS along a spectrum ranging from low to high activity (Del Giudice et al., 2011), and whichever pattern an individual displays is thought to be adaptive to the individual's current social and physical environment. Individuals may display one pattern of SRS activity