The Effect of Envrionmental Stresses on the Gender Ratio of a Population

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It is known that after the 2011 earthquake in Japan, the sex ratio of the subsequent population was skewed in favor of girls. However, it is not known whether the environmental stress caused a gender bias due to less males conceived or more infant males dying as a result of environmental stress (or if the gender bias was merely due to chance). The experiment explores the possibility that environmental stressors may cause a change in the conception of males, or that infant males may be less fit for survival than their female counterparts. Occasionally pregnant females' immune systems attack male cells, causing miscarriage and the experiment will determine if environmental stressors amplify this reaction, causing the gender bias. However, if the same number of males was born, but a disproportional amount died compared to females, it would support research that females are more fit for survival as infants. Drosophila melanogaster and vibrating motors were used to simulate organisms being exposed to varied amounts of stress: one group was exposed to strong vibrations for 10 seconds (simulate earthquake), and one group was exposed constantly (simulate earthquake and stress/havoc that followed). Then the sex ratio of the groups was determined. The data and data analysis show that the environmental stress affected the sex ratio. Because the constant stress group was affected more than the one-time stress group, it can be concluded that the amount of stress is proportional to the magnitude of the change in ratio. This information is useful because women will be more wary of environmental and emotional stress due to its correlation with the miscarriage/death of male babies.

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