Investigating Psychological Determinants of Efficient Behavioral Changes by Community Members To Pursue a Common Interest Using the Drosophila Model

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Solving various social problems—such as environmental pollution and epidemics—requires the majority of the community members to pursue behavioral change. The type of behavior adopted is determined by psychological change, which reflects the biological response of the brain. The purpose of this study was to identify psychological determinants that induce behavioral changes in community members by studying the expression of emotion-regulating genes and behavioral analysis in the Drosophila model. For this end, various exposure–target environments—nonstimulating, stable, and threatening environments—were created with water, propionic acid, and cinnamon extract, respectively. For each combination, the migration rate from the exposure environment to the target environment plus the expression of emotion-regulating genes were analyzed. Drosophilas exposed to threatening environments showed steady migration patterns and increased expression of SerT and CCKLR-17D3—genes that inhibit anxiety and fear—and Grd—a gene that promotes satisfaction. In contrast, irregular migration patterns were observed from all three combinations with threatening target environments. And, interestingly, from stable environments to threatening environments, migration rate increased irregularly; here, SerT and CCKLR-17D3 expressions increased, but Grd expression did not. The results imply that effective behavioral changes are induced when the problems of the current environment are specifically recognized, and the compensation provided in the new environment is clearly understood. In conclusion, to elicit behavioral changes in community members to solve social problems, they must clearly recognize the current problems and have confidence that change will bring about stability and satisfaction.

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