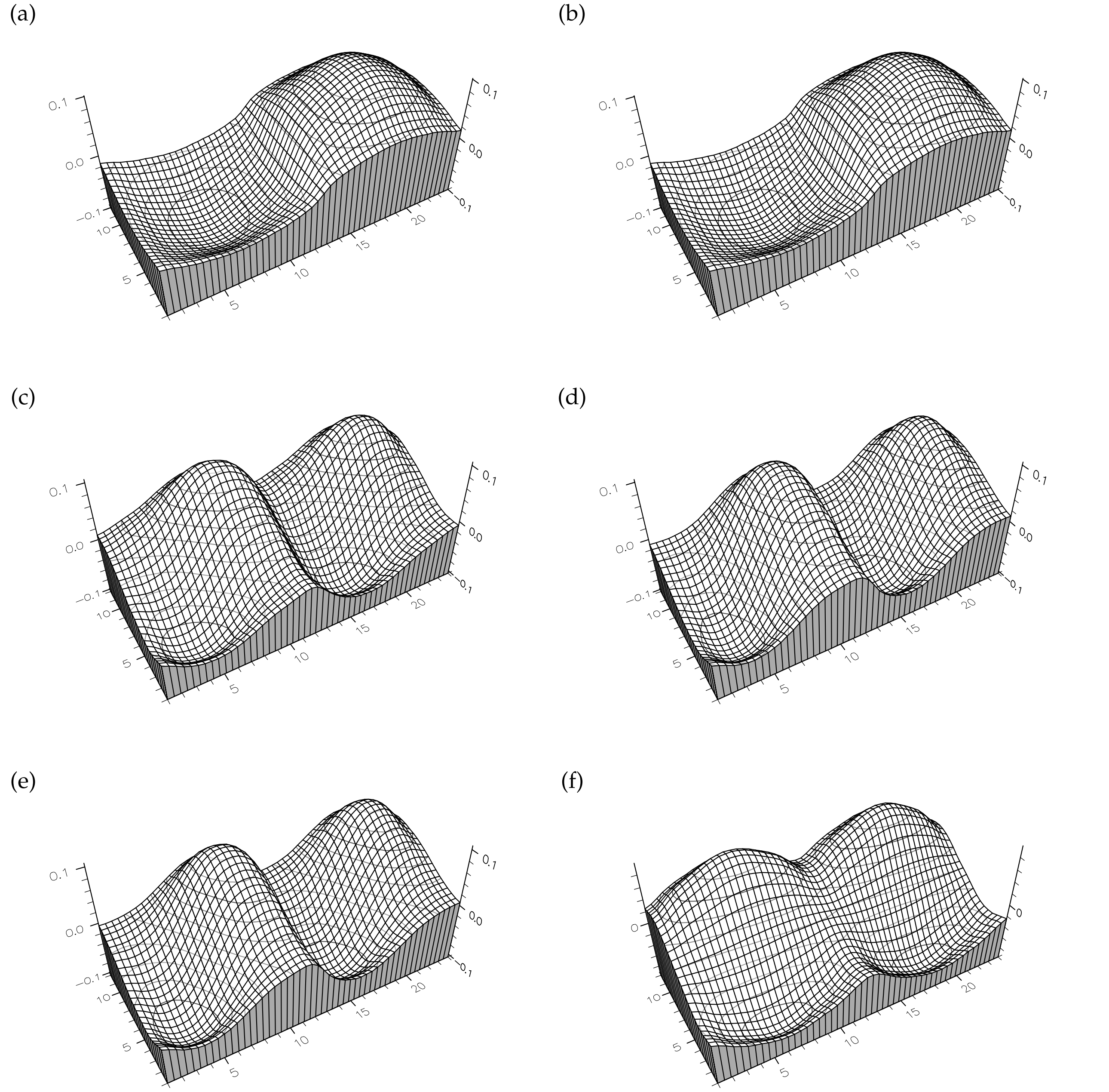

Figure 4.2: Effect of positive cross-eye correlations on the principal eigenvector (not including the (1s,1s) eigenvector, which has largest eigenvalue but is removed by the normalization). (a) No perturbation: the monocular (1s,-1s) dominates. (b) $\epsilon = 0.05$: (1s,-1s) is unchanged and remains dominant. (c) $\epsilon = 0.10$: Now a binocular (2p,2p) structure has taken the lead. (d) $\epsilon = 0.15$: (2p,2p) remains in the lead. (e) $\epsilon = 0.20$: (2p,2p) remains in the lead. (f) $\epsilon = 0.25$: A different binocular (2p,2p) structure takes the lead.

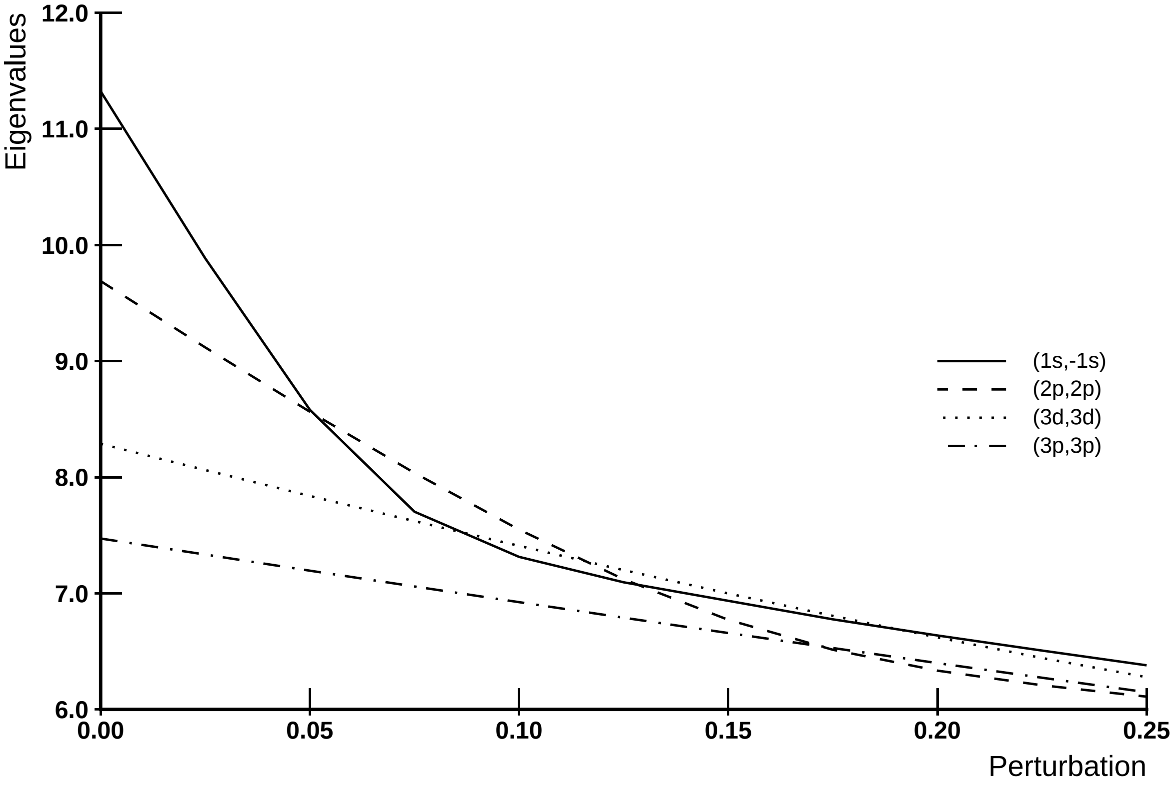

Figure 4.3: Effect of negative correlations within an eye on the eigenvalues of the principal eigenvectors (not including the (1s,1s) eigenvector, which has largest eigenvalue but is removed by the normalization). Note that the eigenvalues change nonlinearly with the perturbation, since the perturbation gradually changes the qualitative form of the eigenvectors, but that eigenvalues still cross.

the size of the perturbative changes in the eigenvalues will become increasingly inaccurate as the perturbation increases. However, our analysis still correctly predicts the directions and relative sizes of the changes. Again the principal eigenvector becomes binocular for perturbations beyond a certain point. An interesting point to note is that although the eigenvector that was initially of monocular form (1s,-1s) retakes the lead for large perturbations, it has now deformed into roughly (2s,-2s), and is thus no longer monocular.

4.5.3 Different perturbations in each eye: $Q_c = 0, Q_1 \neq Q_2$

The eigendecomposition of $Q_*^\epsilon(Q_1, Q_2, 0)$ is given in table 4.5. The most important point to note is that the zero-DC eigenvectors are not stable to the perturbation: they have changed their form from (x_i, x_i) and $(x_i, -x_i)$ to $(x_i, 0)$ and $(0, x_i)$. As explained above for Linsker's system, even if an eigenvector of the form $(x_i, 0)$ was dominant, this would not lead to left-eye dominant monocular units since right-eye weights would grow

E-vector	E-value of Q_*^M	Eigenvalue of $Q_*^\epsilon(Q_1, Q_2, 0)$
$(x_i, 0)$	λ_i	$\lambda_i + \epsilon x_i^T Q_1 x_i$
$(0, x_i)$	λ_i	$\lambda_i + \epsilon x_i^T Q_2 x_i$
$(y_i, -y_i)$	μ_i	$\mu_i + \epsilon y_i^T (Q_1 + Q_2) y_i / 2$
(z_i, z_i)	ν_i	$\nu_i + \epsilon z_i^T (Q_1 + Q_2) z_i / 2$

Table 4.5: Case of $Q_1 \neq Q_2, Q_c = 0$: different perturbations in each eye.