

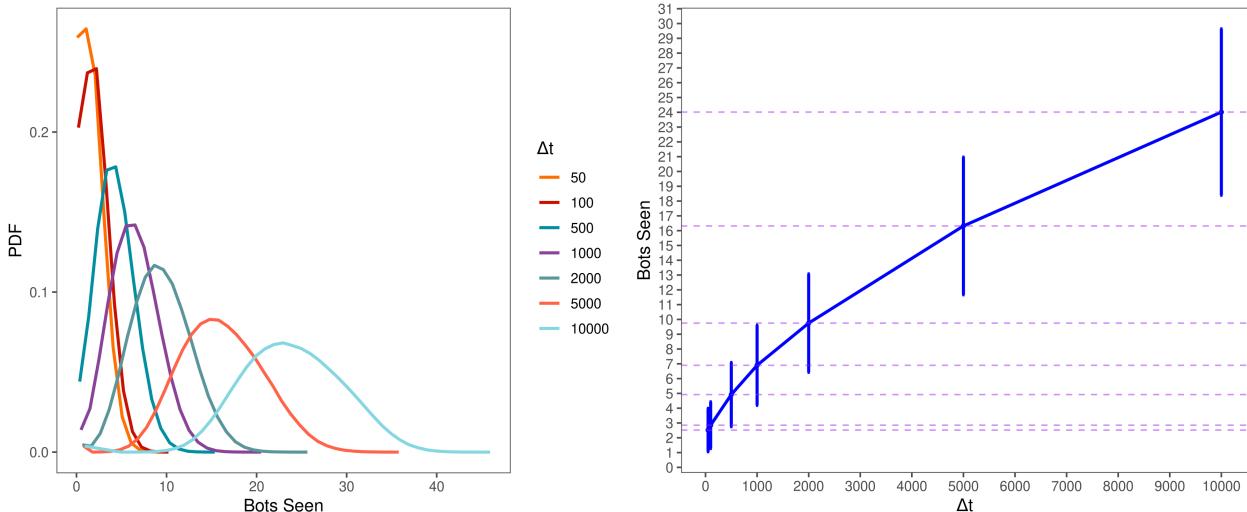
KILOMBO RESULTS

Model conditions

- *a priori* probabilities π_1, π_2 :
- Site qualities q_1, q_2
- Interdependence λ
- Exploration time Δt :
- $N = 50$

1. Bots seen

- The longer the exploration time, the higher the mean and standard deviation.



2. Dance frequencies as a function of time

Effect of quality of good site, q_2 :

- The frequency of bots dancing for site two increases while bots not dancing decreases.
- Frequency of bots dancing for site one decreases with higher values of q_2 .

Effect of interdependence, λ

- Increasing interdependence also causes an increase in f_2 and a decrease in f_0 and f_1 .
- At $\lambda = 0$, f_0 is higher than f_2 in all conditions.

Effect of exploration times

- Shorter Δt reach stationary state faster.
- f_2 reaches higher values for Longer Δt .

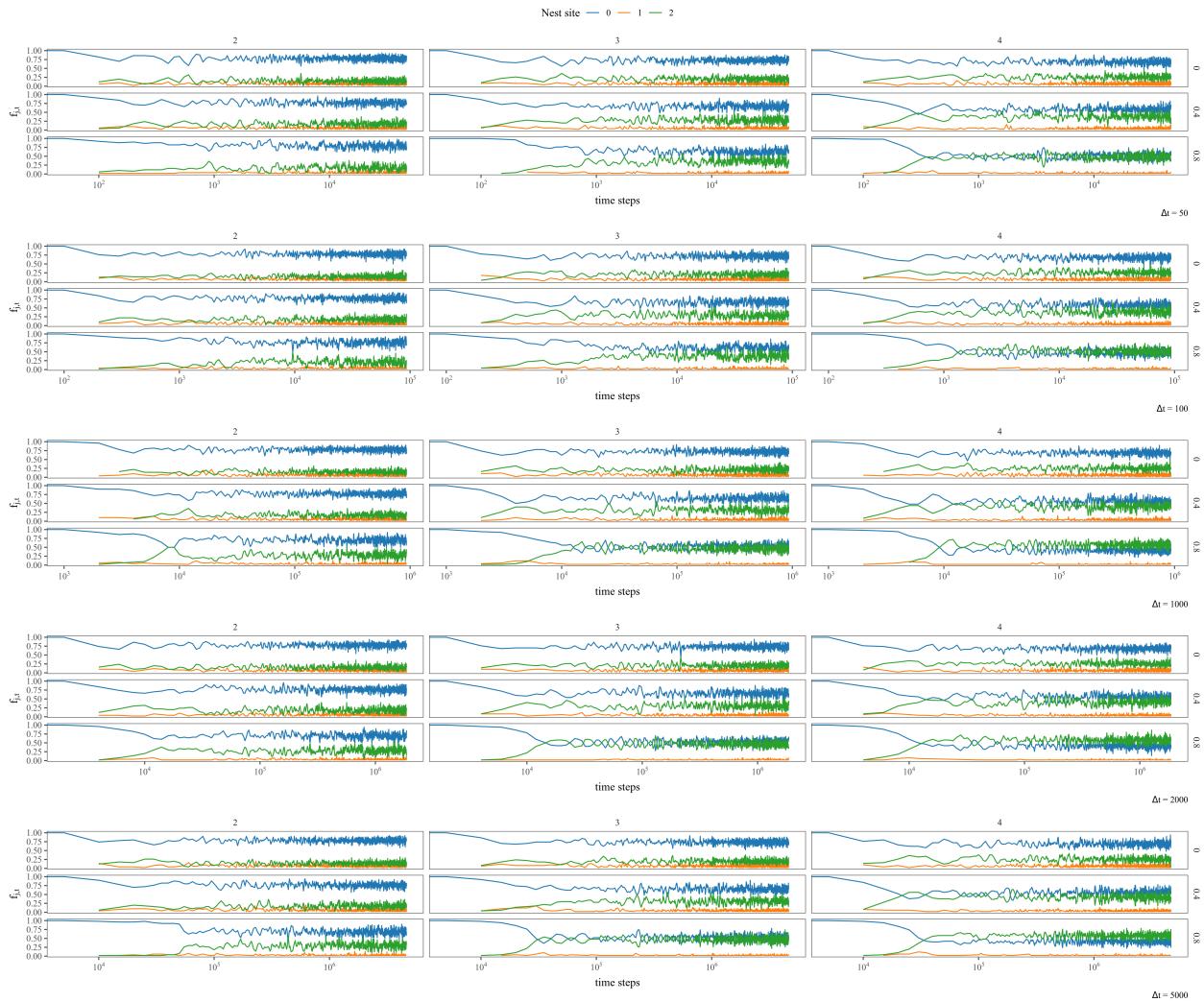


Figure 2. Dance frequencies as a function of time for $q_1=1$ and $q_2 = \{2,3,4\}$, $\lambda = 0, 0.4, 0.8$ and $\Delta t = 50, 100, 1000, 2000, 5000$.

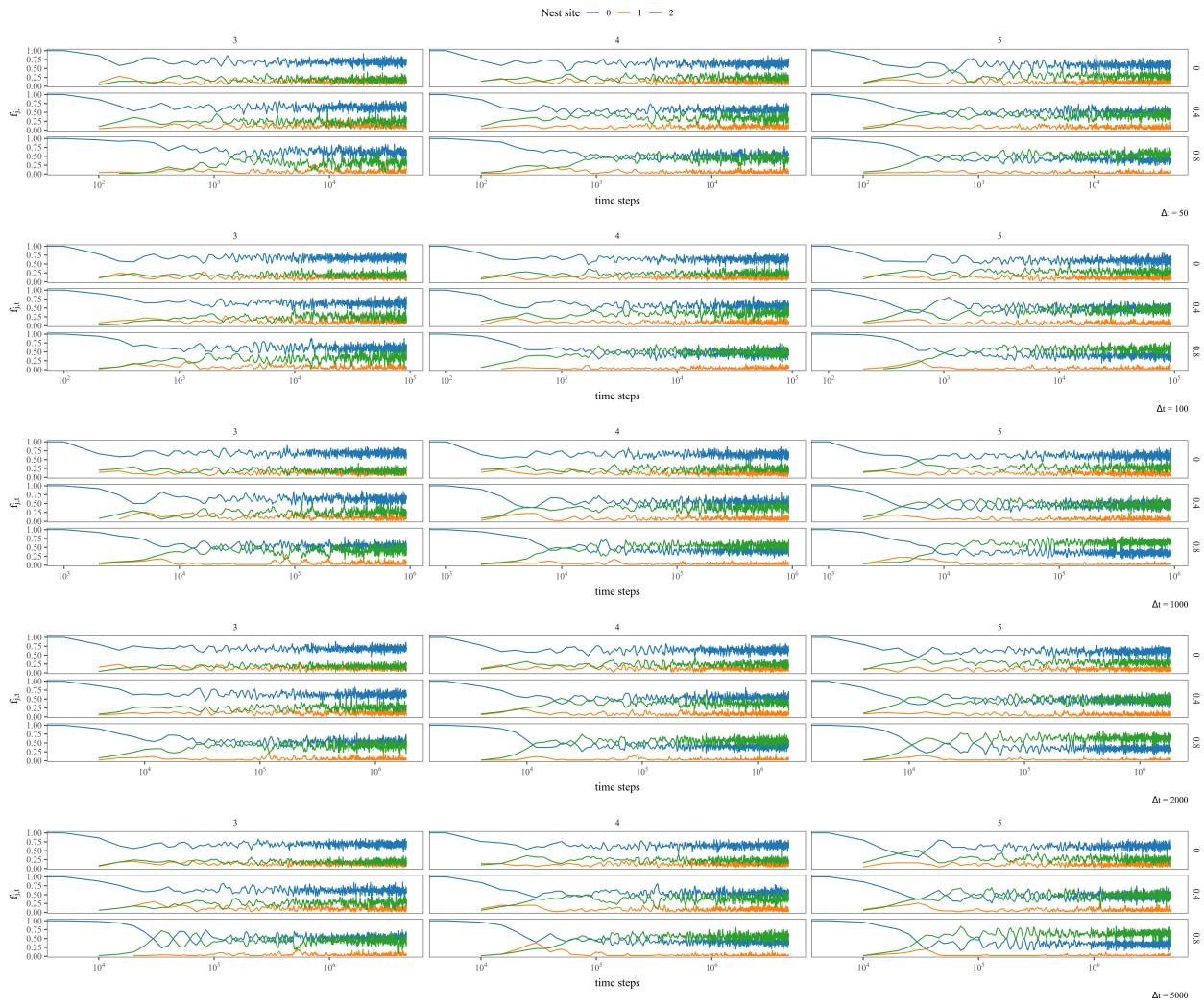
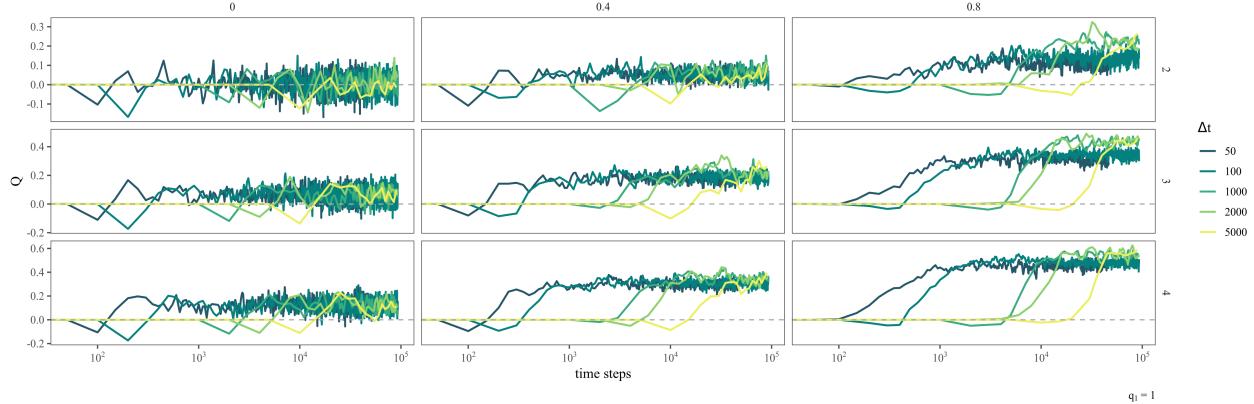


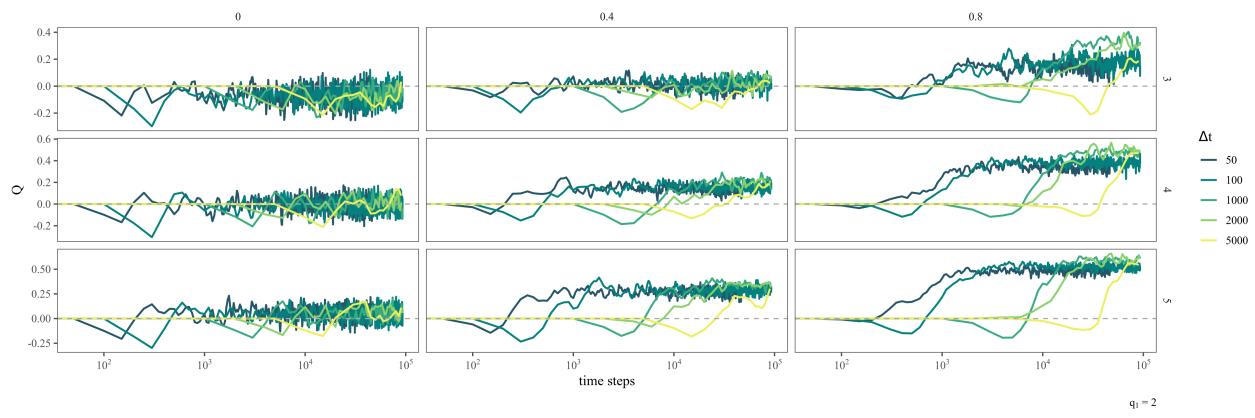
Figure 3. Dance frequencies as a function of time for $q_1=1$ and $q_2 = \{3,4,5\}$, $\lambda = 0, 0.4, 0.8$ and $\Delta t = 50, 100, 1000, 2000, 5000$.

3. Consensus as a function of time

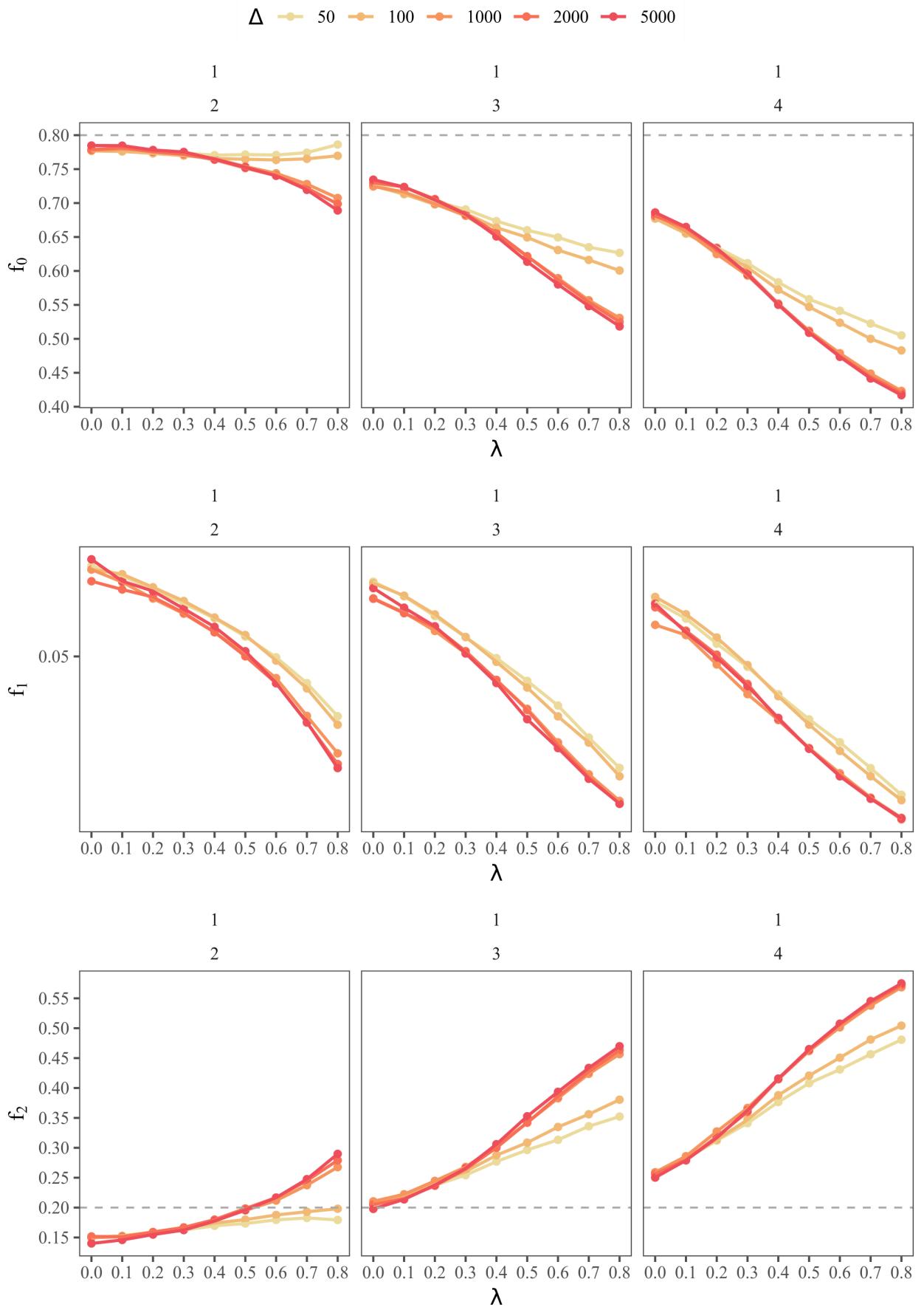
Definition of consensus:

$$Q = f_2 - 2f_1$$

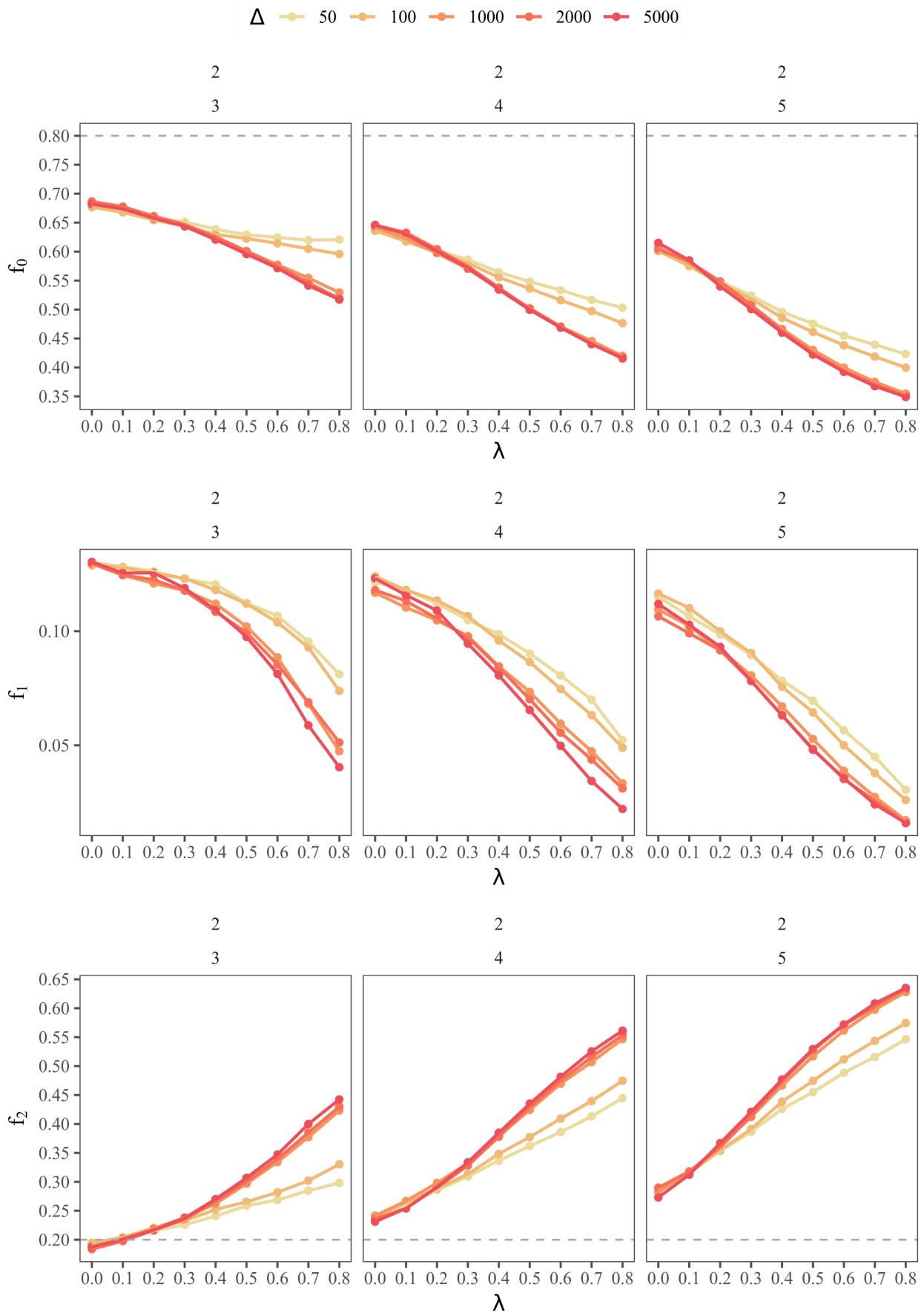




4. Stationary dance frequencies

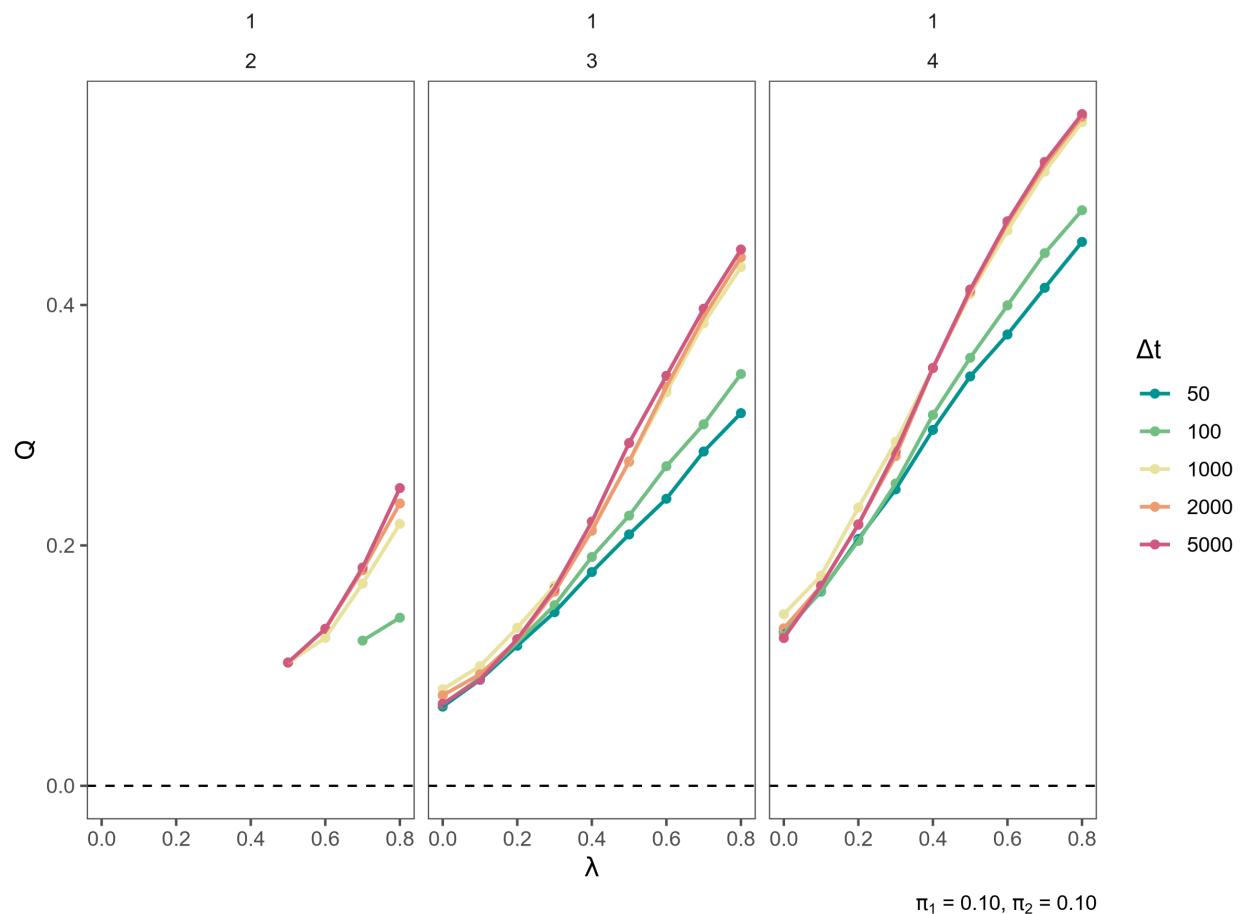


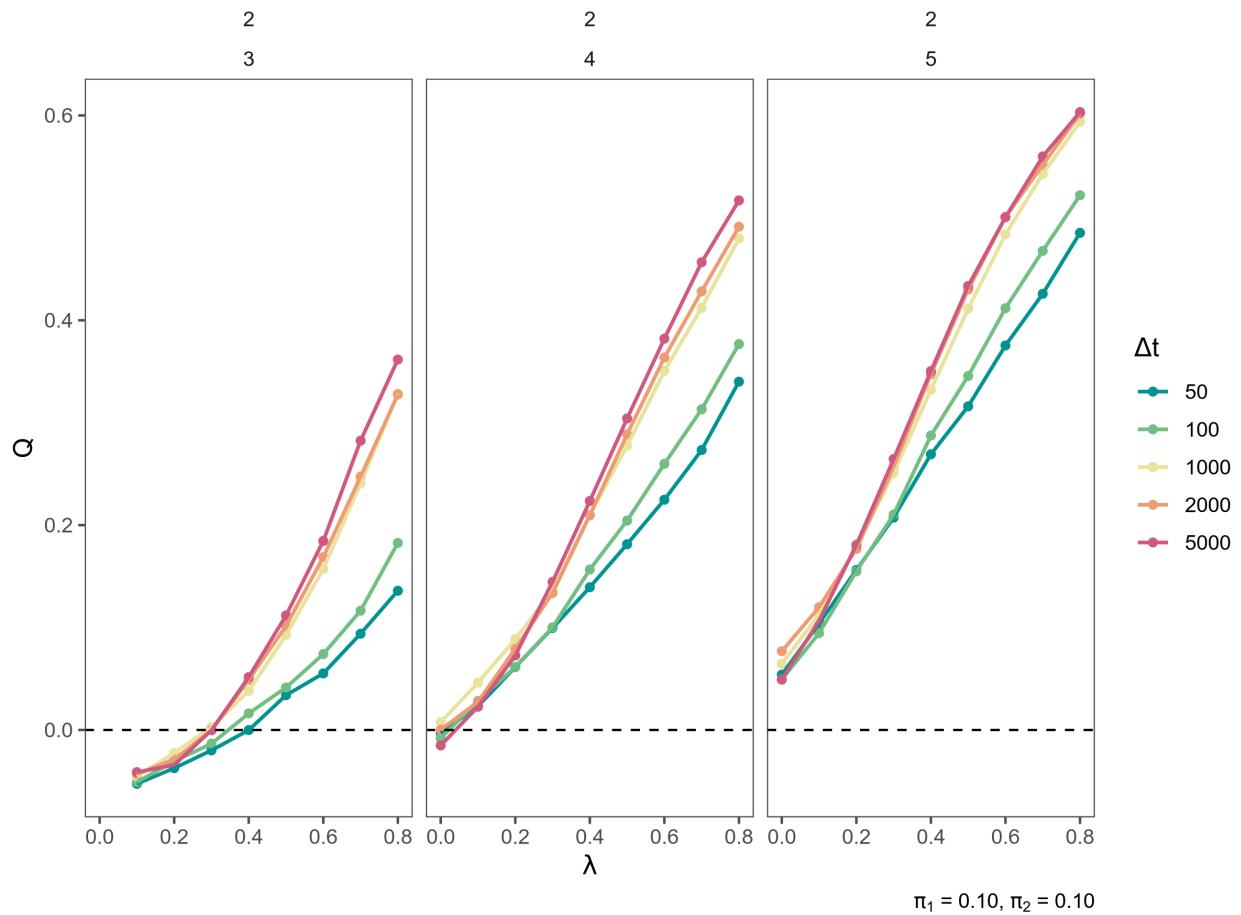
Stationary dance frequencies as a function of interdependence, for $q_1=1$ and $q_2 = \{2,3,4\}$, $\lambda = 0, 0.4, 0.8$ and $\Delta t = 50, 100, 1000, 2000, 5000$



Stationary dance frequencies as a function of interdependence, for $q_1=2$ and $q_2 = \{3,4,5\}$, $\lambda = 0, 0.4, 0.8$ and $\Delta t = 50, 100, 1000, 2000, 5000$

5. Stationary consensus





Main conclusions

- For all conditions, it takes a little longer than $10 \Delta t$ cycles to reach stationary Q . Again, we need to decide a method for measuring time to consensus to be able to say if different λ and dance times significantly affect time to consensus reaching.
- Q reaches higher values as q_1-q_2 ratio increases.
- Shorter Δt reach consensus sooner.
- Higher λ have a greater effect in dance frequencies and Q values differences between Δt .
- Consensus reaching, both in speed and strength, is not significantly different for $\Delta t = 1000$, $\Delta t = 2000$ time steps.
- Stationary Q is similar from $\Delta t \geq 1000$.
- Stationary Q as a function of λ for different q_1 (with corresponding q_2) shows a different behavior. For $q_1 = 1$, consensus is reached for all λ values. For $q_1 = 2$, the line is steeper, which results in consensus not being reached or being very low for low λ , but reaching higher values for high λ . This behavior is due to an increase in f_1 for $q_1 = 2$ greater than the decrease and increase in f_0 and f_2 , respectively.