

Re: Hamilton's rule

Source: <http://sci.tech--archive.net/Archive/sci.bio.evolution/2005-11/msg00240.html>

- *From:* Guy Hoelzer <hoelzer@xxxxxxx>
 - *Date:* Tue, 15 Nov 2005 15:29:32 -0500 (EST)
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in article dl58qa\$P81\$1@xxxxxxxxxxxxxxxxxxxxxx, Catherine Woodgold at an588@xxxxxxxxxxxxxxxxxxxxxx wrote on 11/12/05 9:29 AM:

- > Guy Hoelzer (hoelzer@xxxxxxx) writes:
- >> My confusion is rearing its ugly head again. If the axes of the graph are
- >> "frequency in focal individual (Y axis) vs frequency in population (X
- >> axis)", then I don't see how dominance/recessiveness can influence the lines
- >> at all. What am I missing?
- >
- > One of the lines is labelled "donor". The only individuals
- > who act out the "donor" phenotype are the ones which have
- > the set of genes that code for altruism. If altruism is
- > a recessive trait, then all of the "donors" must have
- > two copies of the altruism gene. Therefore the frequency
- > in the "donor" focal individual is always 1 if altruism
- > is a recessive trait.
- >
- > But if the altruism gene
- > is dominant, then the set of "donors" includes some
- > individuals with one copy of the gene and some individuals
- > with two copies of the gene. If an individual is
- > observed to carry out an altruistic act, or if it
- > finds itself experiencing an overwhelming urge to
- > carry out an altruistic act, then an observer
- > (or the organism itself) can conclude that the
- > individual has one or two copies of the altruism gene.
- > The expected frequency in this individual can thus be
- > predicted to lie between 0.5 and 1 (closer to 1 if
- > the altruism gene is very common in the population).

Maybe I should have said more. All of this was apparent to me. In the artificially restricted world of modeling perfect dominance/recessiveness the starting point of the donor line would be 0.5 (pure recessiveness) or 1.0 (pure dominance). In either case, however, there is a simple linear relationship on the frequency/frequency graph that converges on the point (1,1). The comment you quoted above came from a discussion where I thought it was implied that the shape of the relationship (e.g., linearity) was said to depend on dominance/recessiveness. I may have been reading too much into Jim's comments, which I still think reached way outside the scope of the

simple frequency/frequency graph.

Guy

- *Follow-Ups:*

- ◆ *Re: Hamilton's rule*

- ◇ *From:* Perplexed in Peoria

- *References:*

- ◆ *Re: Hamilton's rule*

- ◇ *From:* Catherine Woodgold

- Prev by Date: *Re: Chemicals Do Not Benefit*

- Next by Date: *Re: Hamilton's Rule invalid*

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