

February is important to everyone for two reasons: Valentine's Day and my birthday. But let's focus on the former, and specifically what mathematics can say about relationships.

I have been reading an article by a group of psychologists and mathematicians that observed that much of marriage counselling has been based on theories that lack a scientific basis. For instance, a couple of renowned therapists put forward an idea that marriages founder because of inequities between spouses and recommended that some sort of contract of equality be agreed upon.

The theory soon became practice in therapy, even without any scientific backing. It seemed reasonable, doesn't it? Yet when, years later, its efficacy underwent statistical testing, it was found that couples who had such agreements in place were the marriages most in trouble.

As a scientist, I demand experiments and data. Belief in what seems reasonable is never enough — I need proof.

What these scientists found out in various experiments with couples is intriguing. They found that an excellent indicator of whether a marriage would survive and thrive is the pattern of interactions between spouses. In particular, the ratio of positive to negative interactions in the best-relating couples turned out to be at least five, with troubled couples having a lower ratio. The researchers note that it is not easy to change this ratio for couples, so it is best if you practice improving your positive versus negative responses early in a relationship.

The research showed even more.

Apparently, not all negative attitudes are equally bad for a marriage. Data indicated that four behaviours — criticism, contempt, defensiveness and stonewalling — in particular led to a path of divorce. With these and a few other variables, the researchers were able to predict with 90 per cent accuracy that couples would divorce.

The authors of the article also said their research shows that within a marriage, problems break down into two groups — those that can be resolved and those that can't, and the latter group accounts for 69 per cent of marriage problems.

The long-standing, unresolved problems were attributed to basic differences in personalities. This was an astounding fact to me and one I put to good use recently.

My wife and I were in the midst of an argument about several things, and one of us was frustrated that we were arguing, yet again, about an old issue. I could raise the point that this particular problem was likely intractable and going to arise over and over again, no matter how much we tried to solve it. And the key to dealing with it and other similar things, the researchers found was how we talk about it, not whether we can change each other's point of view. After this revelation (for both of us), much of the anger in the argument dissipated.

Score one for science and mathematics.

There is much more useful relationship information in their paper based on the data from real-life couples. But what they go on to do is create a theoretical model for how couples interact, based on an area of mathematics called "non-linear difference equations."

The idea is essentially that husbands' and wives' moods not only influence their mood in the next instant, but also their partner's mood.

Coupledness is hard work, but oh so worthwhile. And when it comes to love, you, too, should count the ways.

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