

'Two hearts that beat as one': does love cause physiological synchrony?

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If you are looking for a card to celebrate an anniversary or St Valentine's day, you may well come across a selection featuring the well-known sentimental lines: 'Two souls with but a single thought, two hearts that beat as one.' These days the saying is probably best known from a song by the rock band U2¹ but in greeting cards and on the internet, it is usually attributed (wrongly) to the English romantic poet John Keats. Its true source is a play by the Victorian actress Maria Ann Lovell, called 'Ingomar the Barbarian',² and adapted from the Austrian playwright Friedrich Halm. Both authors disappeared into obscurity, so it was presumably easier to give the credit to Keats.

The lines appear in a song, as follows:
 'What love is, if thou wouldst be taught,
 Thy heart must teach alone, —
 Two souls with but a single thought,
 Two hearts that beat as one.

And whence comes love? Like morning's light,
 It comes without thy call.
 And how dies love? A spirit bright,
 Love never dies at all!

It is rather intriguing that two lines by a forgotten Victorian actress could have caught on so powerfully in the popular imagination. Could this be because there is some biological truth to it? When people are in love, do their hearts really synchronise?

On principle, this seems unlikely. Heart rate is determined by many internal and external influences that strong passion could scarcely override. Even if Romeo and Juliet did have an occasional heart-beat in synch, a difference of a fraction of second in subsequent beats would soon lead their pulses to diverge. In literal terms, the idea of 'two hearts that beat as one' is probably a non-starter. However, couples do affect each other's physiology in more subtle ways. A large number of studies have looked into these. Although they do not confirm the saying, they shed interesting light on physiological coupling.

KEY RESEARCH

One key piece of research was carried out by scientists at the Universities of

California and Arizona.³ Their literature review addresses what was already known about such effects. These include lower levels of blood pressure when interacting with a romantic partner than with someone else. Women completing a stressful task in the presence of a romantic partner also have a lower heart rate than those completing the task alone. Anxious individuals produce higher levels of cortisol when separated from a romantic partner for an extended period, and so on. However, as the authors point out, these studies all focused on individuals rather than how each person was affecting the other. When studies of interactive effects have been done, they have been rather broad brush. They have found, for example, that partners with high marital distress generally mirror each other in measures such as heart rate and skin conductance while non-distressed couples do not. This would fit the hypothesis that couples who are not getting along are more likely to 'wind each other up' than couples where each person can keep calm in the presence of a distressed partner.

In their own study, the US authors monitored romantic partners during three different activities. After a period of calm together, the couples were told to gaze into each other's eyes for 3 min, and then asked 'to imitate one another's physiology.' Respiration patterns between romantic partners aligned during these tasks, when they would have been able to follow each other's breathing, rather like classical musicians do when performing. More interestingly, their heart rate also aligned even though the pulsation of arteries is not usually as visible. There were significant gender differences, with the women tending to adjust their heart rates in response to their male partners more than vice versa. It seems that where two hearts do synchronise, they are more inclined to beat to the male rhythm, at least in heterosexual Americans.

STRANGERS AND LOVERS

Other imaginative studies have followed. One looked at the synchronisation of heart rate in longer-married couples, in relation to the time they spent in each other's company.⁴ Another monitored heart rate as couples talked about positive and negative aspects of

their relationship.⁵ Possibly the most ingenious study tried to simulate the effects of a male partner holding his wife's hand during delivery of their baby, using a heat pad as a surrogate source of pain.⁶ All had significant results, although not necessarily in the same direction. None of these studies used control pairs who were not romantically linked. A group of researchers who did this found that synchrony may be greater with strangers than with lovers.⁷ A systematic review has drawn attention to 'theoretical, methodological and statistical issues' that need to be addressed to bring coherence to the field.⁸ Altogether, it appears that matters are more complicated than poets might wish.

Finally, one piece of research has called into question the whole idea that being in physical proximity is the only important factor in physiological coupling. It can even happen when individuals do not know each other and have the same experience in different places. Scientists at the City University in New York asked volunteers to listen to an audio recording of some writing by Jules Verne, and then to watch an instructional video and listen to children's stories, all while hooked up to electrocardiograms.⁹ As the subjects listened or watched, their heart rates went up or down at exactly the same points in the narratives. In other words, their responses resulted from receiving the same information, rather than from picking up messages from anyone else. These effects disappeared if they were distracted or had disorders of consciousness that made it harder for them to concentrate.

As these authors point out, conscious processing may be more important in mediating human synchrony than subliminal, hormonal or supernatural signals. Sadly, it seems that just putting two souls in touch with a single thought, even if they are strangers and apart, may be just as effective as undying love in getting two hearts to beat as one.

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