





McCabe. The game always involves 2 people, the “subject” and the “stranger”—a person the subject has never met. It also involves money.

In Zak’s version, the subject is said to trust the stranger if the subject withdraws money from a fictional (or actual) account and then gives some of it to the stranger. The subject has been informed that on receipt of the funds, the stranger will reciprocate, returning either the same amount or an even greater amount of money, at a later date.

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The trust game is divided into several steps, as described below (Figure). Because reactions to other people can be easily influenced by physical appearance, perceived affect, and even clothing, it is important that neither participant has face-to-face contact. Both the subject and the stranger are thus seated at computers away from each other. They are both given \$10 for participating in the study.

Step A. The experiment begins when the subject is told by the computer to make a monetary decision. The subject is asked whether he or she would like to send all or a portion of his \$10 to the stranger. The computer tells the subject that if he decides to part with some of the money, the stranger’s account will receive triple the amount that the subject donated. If the subject chooses to send \$5, the stranger’s account will be credited with \$15, plus the \$10 the stranger

already has. This is a pretty good deal for the stranger, who now has \$25!

Step B. The computer now informs the stranger about the subject’s decision, and then asks the stranger, “Would you like to return some of the subject’s money?” The stranger is informed that he does not have to return any of the money. Even if the stranger decides to be generous, the “tripling” effect will not occur in the subject’s account. All decisions will remain confidential, no deception is ever allowed, and real money is at stake.

How do people react? The game has been performed numerous times in many countries, sometimes with breathtaking amounts of real money. Results from Zak’s laboratory are typical. About 85% of subjects give at least some money to the stranger. The stranger who receives the money almost always gives some of it back to the subject (about 98% return money).

Although the behavioral work is interesting, the really compelling findings concerned the levels of oxytocin in the participants’ brains, the results of which eventually led to an “intervention” experiment. The researchers found that the strangers’ brains produced bucketloads of oxytocin when they received their free monetary gift from the subjects. The interpretation was that they were “trusted.”

The effect was dose-dependent. The more money the strangers received, the more oxytocin was released in their brains. There was no increase in the level of this peptide in control groups

who received monetary gifts in a random, nonpartner-dependent fashion.

Interestingly, strangers with higher baseline levels of oxytocin before the experiment almost always gave more money back to the subject as the experiment unfolded than did strangers with lower levels. That was not true of the subjects. Elevated levels of oxytocin in these participants did not predict higher initial monetary “gifting.” Clearly, there was a relationship between trusting behaviors and oxytocin levels. It was almost as if the establishment of trust-competent situations had to be inaugurated to coax oxytocin levels to come out of their neurological dens.

## **Or Was it the Other Way Around?**

The data seemed to suggest that the recognition of trust-competent social interactions was being mediated by oxytocin release. However, because association never means causation, the next experiments involved intervention protocols. What if oxytocin levels were artificially supplied to the participants? Would their behavior change? If that were true, supplying oxytocin to the subjects might increase the percentage of giving to the strangers on the computer.

Oxytocin was formulated to work as an inhalant, and 200 subjects in the experimental group were exposed to the peptide. Consistent with the hypothesis (although perhaps in contradiction to previous baseline findings), there was an increase in the amount of money the subjects gave to their cognate strangers (about 17% more). An unexpected finding also emerged. A large number of oxytocin-treated subjects (almost half) gave their entire cash amounts to their partners! This was very different from the controls and may have been the most revealing part of the experiment. With apologies to Fritz Perls, it appeared that elevated levels of oxytocin in the brain produced a background “trust gestalt” in the subjects that made them much more willing to part with their money.

## **Conclusion**

These are certainly interesting results, but before we encourage grocery store managers to pretreat their stores with aerosolized oxytocin (air-soluble oxytocin, at least as configured by the researchers, is very easy to detect, by the way), a few cautions might be in order.

The effects, while dramatic in some participants, had no noticeable effects on other members of the group. Elevating oxytocin levels in these unresponsive populations was simply not enough to coax them to project positive faith into their social interactions. This unevenness suggests that feelings of trust have many complex components, and oxytocin, while prominent, may not be a one-size-fits-all explanation for everyone’s trusting behaviors. Moreover, it was not the absolute levels of oxytocin that predicted the trusting behavior but the rise in levels from a baseline. This is an important insight because, if you recall, initial baseline levels in the subjects did not predict their generosity—the acute change did.

There are also environmental issues to consider that were suggested by this change-over-baseline finding. There is evidence that people have oxytocin “set points”—a thermostatesque mechanism that can be deeply influenced by environmental issues, including stress. How

stressed you are may thus profoundly influence your ability to rise from your baseline. Because the peptide normally interacts with a wide variety of biochemicals throughout the body (levels can fluctuate on an hourly basis), your ability to trust may depend on the time of day. There may even be sex considerations. Estrogen increases the uptake of exogenously supplied oxytocin to specific tissues in the body. If you are female, your ability to trust may not only depend on the time of the day but also on the time of the month.

Finally, there are definitional issues to consider. Most economists believe that 2 different events are being measured in these experiments. Only the subject's behavior involves measurable trust, at least by current definitions. The stranger's behavior is classified differently; he is exhibiting what is being termed "trustworthiness." Are these the same? Are they different? Are they parts of a continuum? Semantics? Both subject and stranger seemed to respond to oxytocin, but exactly what that means is not necessarily straightforward.

None of these comments are deal-breakers, of course, but simply represent the growing edge of some really fascinating findings. The data also predict something about the future way of thinking about things and even a new academic unit. The man most responsible for these findings, Paul Zak, is not a brain scientist at all. He is an economist, founding director of the Center for Neuroeconomics Studies, at Claremont Graduate University (he was trained in neuroimaging while in a postdoctoral fellowship at Harvard University).

As a brain scientist who has spent many years navigating the gap between basic research and business, I might be suspicious of such a background. However, his findings and those of his colleagues are compelling stuff. On a distrustful day, perhaps I can borrow one of Paul's inhalants.

Figure

## The mechanics of the “trust game”

Shown below is the operational structure of the trust game that was used to investigate the effects of oxytocin in human behavior. Divided into 4 steps, the game proved valuable in determining the role the peptide plays in the presence of anticipated monetary reward. The experiment involved 2 persons, a “subject” and “stranger,” each of whom were given a certain amount of money for participating in the experiment.

**1**

### Subject queried

The subject is asked by the computer whether she would like to donate her money to the stranger. She is told that if she donates, the stranger will receive triple the amount.



“Subject”

**2**

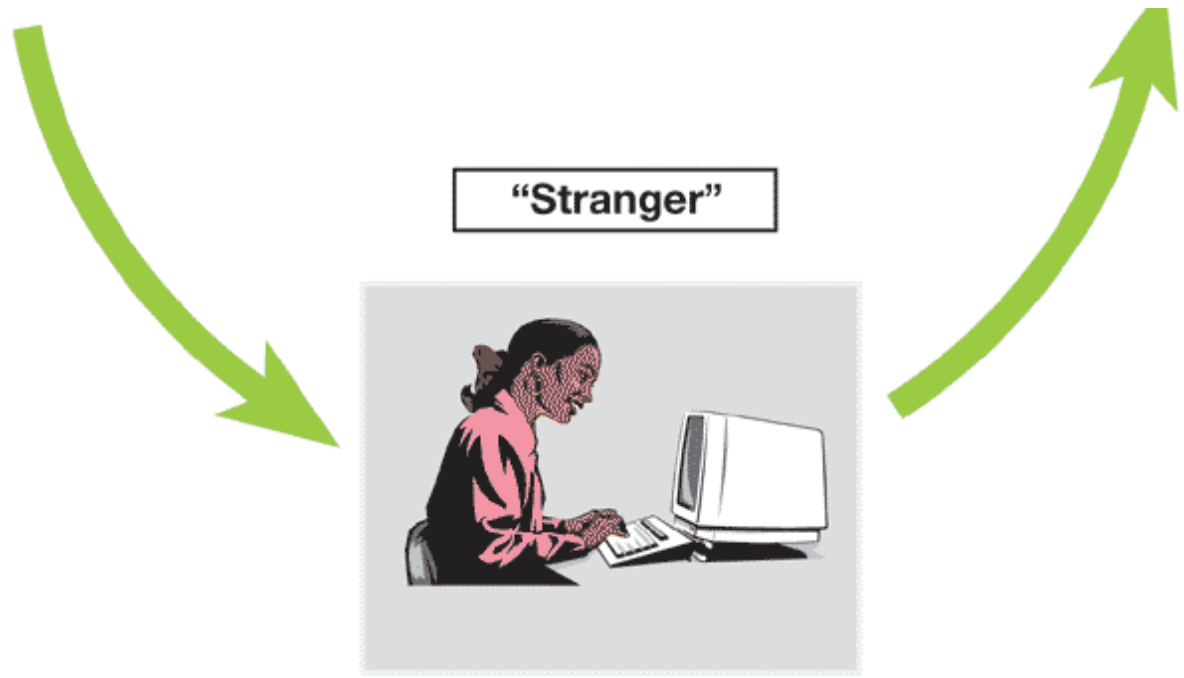
### Donation executed

The subject decides. Most (about 85%) choose to give at least some money.

**4**

### Donation executed

The stranger decides. Most (about 98%) choose to give some money back.



**3**

**Stranger queried**

On receipt of the tripled funds, the stranger is asked whether she would like to give some money back to the subject. She is told that the tripling effect will not occur.