

# Why moderate beliefs rarely prevail

October 2 2012, by Lisa Zyga

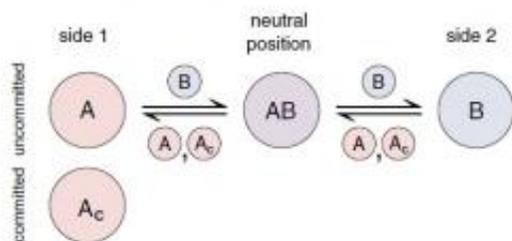


Diagram of the model structure. Arrows indicate which types of speakers can convert listeners from one subpopulation to another. Members of the committed A population, the zealots, cannot be converted. When zealots reach a certain threshold of the population, they are capable of converting everyone to their perspective. Credit: Marvel, et al. ©2012 American Physical Society

(Phys.org)—We live in a world of extremes, where being fervently for or against an issue often becomes the dominant social ideology – until an opposing belief that is equally extreme emerges to challenge the first one, eventually becoming the new social paradigm. And so the cycle repeats, with one ideological extreme replacing another, and neither delivering a sustainable solution. Political revolutions, economic bubbles, booms and busts in consumer confidence, and short-lived reforms such as Prohibition in the US all follow this kind of cycle. Why, researchers want to know, does a majority of the population not settle on an intermediate position that blends the best of the old and new?

"For many political issues, economic policies, [ethical questions](#), and

allocations of funding, for example, the middle road or 'golden mean' between extremes has advantages over either extreme," Seth Marvel of the University of Michigan, lead author of a recent study on moderation, told *Phys.org*. "Furthermore, there are cases – say, with economic policies for instance – where swinging between extremes is costly in itself."

In their paper published in [Physical Review Letters](#), Marvel and his coauthors from the US and Korea explain that there are several ways to explain why few people embrace moderation, but here they give a purely mathematical answer using a "model of ideological revolution." The model reveals that successive ideological revolutions take place in an environment that is not conducive to moderate beliefs. Even when the researchers adjust the model to encourage moderation, eventually the moderate population will almost always either fail to sufficiently expand or collapse altogether.

The model of ideological revolution begins with a community consisting of four types of individuals: those that currently hold an extreme opinion A, those that hold the opposing extreme opinion B, those that hold neither A nor B (the moderates), and those that hold A indefinitely and never change their minds (the A zealots).

To run the model, two individuals are randomly selected to interact with each other, with one randomly chosen to be the speaker and the other the listener. If the speaker is an A or B and the listener is a B or A, respectively, the speaker changes the listener's beliefs to AB. If the listener is an AB, then the listener becomes an A if the speaker is an A, and becomes a B if the speaker is a B. Moderate speakers cannot change a listener's beliefs; only extremists rally others toward their cause.

Running this basic model, the researchers found that the proportion of zealots strongly affects the outcome. When zealots are below a critical

value, the system remains similar to how it started. But above a critical value, the zealots quickly convert the entire population to A.

"Although we didn't mention this explicitly in the paper, a raft of alternatives to our basic model (built from different assumed interactions) all show the same threshold behavior: when the committed believers reach a certain fraction of the community, they are capable of converting everyone to their perspective," Marvel said. "This suggests that a similar threshold may appear in real systems even when those real systems have dynamics somewhat different from our basic model. As the American anthropologist Margaret Mead is claimed to have said, 'Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.'"

The researchers tested seven different strategies for increasing the moderate subpopulation in the model. For example, in one strategy they introduced a "stubbornness parameter" to study the possibility in which moderates are less likely to convert to either of the two radical positions. The basic model has a stubbornness parameter of zero, but increasing the parameter gives the moderates a chance to retain their beliefs after listening to a radical. Although a small value of stubbornness does increase the moderate subpopulation, the researchers were surprised to find that, past a certain threshold, stubbornness drives the moderates to extinction.

They explained that this counterintuitive result occurs because increasing the stubbornness of the moderates initially increases the moderate subpopulation while simultaneously depleting both the uncommitted A and B subpopulations. With a smaller B subpopulation, there is less competition from the B's with both A subpopulations for winning over the moderates. As a result, fewer A zealots are required to convert the entire population to A, making the entire population more vulnerable to a zealot takeover. Once again, evangelism proves to be an important

force in converting a population.

Of the seven strategies the researchers tested, only one could effectively expand the moderate subpopulation – and the strategy was based not on social interaction but on other environmental stimuli, which might take the form of a media campaign in real life. By integrating this new parameter into the model, the number of moderates increased without threat of extinction.

"The one successful strategy, nonsocial deradicalization, involves a particularly strong sort of encouragement of moderation; for example, its terms with the new parameter are independent of the size of the moderate population," Marvel said. "Hence, our findings suggest that this strong form of encouragement may be necessary for spreading a balanced perspective in a sustainable way."

The researchers note that this strategy should be regarded with caution, given that they have not attempted to show that the model's dynamics accurately represent the real world, with its multiple small-scale ideologies, fragmentation of opinions, and other intricacies.

Nevertheless, they hope that this general framework for testing possible strategies that encourage moderation may lead to the discovery of more sophisticated methods.

"Our work finds mathematical reasons why many of the most intuitive strategies for encouraging the moderation position, or 'aurea mediocritas,' may be ineffective at doing so," Marvel said. "As we mention in the article, only one out of seven different strategies that we consider succeeds in increasing the size of the moderate fraction without risking its collapse. This may have implications on what sorts of measures should be taken to encourage even-handedness when we want to do so."

He added that other features of real-world societies emerge in the model, even though the model is more simplistic than the real world.

"As a surprising byproduct of our work, we discover several new features of real networks," Marvel said. "For example, we find that when our [model](#) is simulated on these empirical networks, maverick or contrarian individuals emerge at the social fringe. These individuals retain the outdated dogma even after everyone else has converted to the new ideology. We also find that, even though real networks are much 'sparser' than our all-to-all test networks, our models still play out quite similarly on them, indicating that the surprising behavior of our models may extend well to real systems."

**More information:** Seth A. Marvel, et al. "Encouraging Moderation: Clues from a Simple Model of Ideological Conflict." *PRL* 109, 118702 (2012). [DOI: 10.1103/PhysRevLett.109.118702](https://doi.org/10.1103/PhysRevLett.109.118702)

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