

Past-focused environmental comparisons promote proenvironmental outcomes for conservatives

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Conservatives appear more skeptical about climate change and global warming and less willing to act against it than liberals. We propose that this unwillingness could result from fundamental differences in conservatives' and liberals' temporal focus. Conservatives tend to focus more on the past than do liberals. Across six studies, we rely on this notion to demonstrate that conservatives are positively affected by past- but not by future-focused environmental comparisons. Past comparisons largely eliminated the political divide that separated liberal and conservative respondents' attitudes toward and behavior regarding climate change, so that across these studies conservatives and liberals were nearly equally likely to fight climate change. This research demonstrates how psychological processes, such as temporal comparison, underlie the prevalent ideological gap in addressing climate change. It opens up a promising avenue to convince conservatives effectively of the need to address climate change and global warming.

climate change | temporal comparison | political ideology | attitudes | framing

A spirit of innovation is generally the result of a selfish temper and confined views. People will not look forward to posterity, who never look backward to their ancestors.

—Edmund Burke, *Reflections on the Revolution in France*, 1790

Despite strong evidence that humans are causing global warming (1), there is continuing debate surrounding the issue. Political ideology has been shown to be the strongest predictor of politicians' beliefs regarding climate change (2), and political polarization of beliefs regarding climate change in the United States has increased in recent years (3). Generally, these trends are characterized by relatively low and decreasing support from conservatives (2–4). The link between conservatism and low support for action addressing climate change can have negative social and economic consequences. For instance, simply labeling an energy-efficient product with a message mentioning climate change can reduce the likelihood that politically conservative individuals will purchase the product (5). What explains this stark divide characterized by conservatives' relatively unfavorable attitudes and behaviors, and how can it be overcome?

We address this question using insights from research in psychology and propose that the divide can be explained, in part, by different tendencies in temporal comparisons made by liberals and conservatives. In particular, conservatives tend to evaluate the present relative to the way things were in the past. The tendency for conservatives to be past-focused can be traced to the origins of conservatism. Attitudes such as those expressed in the introductory quotation from Edmund Burke, widely regarded as the philosophical founder of political conservatism, emerged as a reaction to revolutionary movements that sought to break radically with tradition (6–8). Thus, conservative ideology can be traced to the desire to defend the status quo against progressive change, preferring regressive change instead, whereas liberals seek to replace present society with a newer system (9).

Research has shown that conservatives more strongly endorse tradition and conformity and prefer the certainty of the past to the uncertainty of tomorrow (10). These tendencies play out in the political arena as well: Republican presidents refer to the past to a greater extent than Democratic ones in their State of the Union addresses (11). Moreover, conservatives are said to feel a romantic or nostalgic longing for the way society was (12, 13), suggesting that conservatives view progressive policies and ideas as pushing society further away from the cherished past. Indeed, in public opinion surveys in the United States conservatives consistently show stronger beliefs that the state of society is in decline (14, 15).

Against this backdrop, a potential problem becomes clear: Appeals for addressing climate change often adopt a future-focused temporal perspective. Consider an example from United Nations Secretary-General Ban Ki-moon: “The clear and present danger of climate change means we cannot burn our way to prosperity . . . We need to find a new, sustainable path to the future we want” (16). Similar future-focused messages appear in Al Gore's documentary *An Inconvenient Truth*, which presents viewers with images of a scorched and dry future earth (17). What these messages have in common is that they compare the current state of the Earth against a possible future. Simply put, these appeals aim to convince the audience that drastic action against climate change must be taken to create a better future (or to avoid a worse future).

These future comparisons are speculative and often are accompanied by propositions to change the socioeconomic status quo. Conservatives may find such propositions aversive because they violate the tenants of conservative ideology. Furthermore, if conservatives associate progressive change with decline (14, 15), these future-focused messages are unlikely to be convincing. It

Significance

Political polarization on important issues can have dire consequences for society, and divisions regarding the issue of climate change could be particularly catastrophic. Building on research in social cognition and psychology, we show that temporal comparison processes largely explain the political gap in respondents' attitudes towards and behaviors regarding climate change. We found that conservatives' proenvironmental attitudes and behaviors improved consistently and drastically when we presented messages that compared the environment today with that of the past. This research shows how ideological differences can arise from basic psychological processes, demonstrates how such differences can be overcome by framing a message consistent with these basic processes, and provides a way to market the science behind climate change more effectively.

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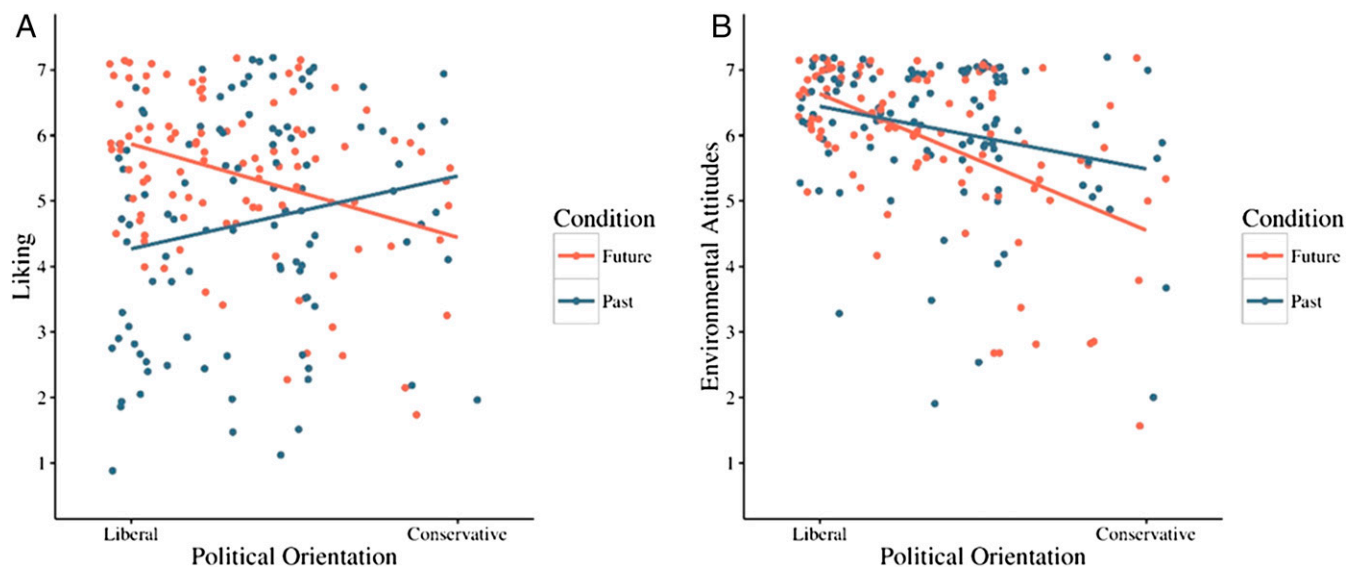


Fig. 1. Study 1. (A) Conservatives dislike the future-focused but not past-focused environmental message. (B) Conservatives report more favorable environmental attitudes after reading a past-focused message (blue line) than after reading a future-focused message (red line).

follows then that conservatives' relatively low support for action addressing climate change may not result from an inherent disbelief in scientific evidence (18) but could be attributed to a lack of fit between future-focused environmentalist appeals and conservatives' dominant past-focused temporal orientation.

Reframing the appeals for addressing climate change to fit conservatives' ideology has proven successful in changing conservatives' attitudes and behaviors. For instance, conservatives expressed more proenvironmental attitudes and behaviors when doing so was framed as an obligation to one's nation (19) or when climate change was described in terms of "contamination" and "purity" as opposed to "harm" and "care" (20). Conservatives' skepticism about climate change science decreased if the solution to climate change was described as supporting capitalism (21). In other words, conservatives can become more proenvironmental when being so aligns with morals and values that are consistent with their world view.

Our approach is similar: Conservatives can become more proenvironmental when appeals to address climate change are framed with a past-focused comparison. Conservatives view the past as better than the present, so an argument that encourages returning to the past will be appealing. Furthermore, any proposed changes to society that are rooted in past comparisons should not be hindered by the uncertainty and decline that conservatives associate with progressive, or future-focused, changes. Altogether, a past-focused framing may encourage conservatives to estimate a greater risk of climate change because the evidence for climate change provided by a past-focused comparison fits with their predominant cultural outlook. On the other hand, future-focused messages may lead conservatives to underestimate the risk of climate change because of a misfit between the framing of evidence and their typical cultural outlook (22).

To test these hypotheses, we recruited participants online via Amazon Mechanical Turk (MTurk), a web-based tool for recruiting and paying participants to perform tasks. MTurk samples tend to produce results that are as valid and reliable as laboratory-based samples (23) and have been shown to be as representative of the United States population as other sampling methods used in political science research (24–26). To avoid the most critical problem with Mturk samples—nonnaivete (27)—participants were barred from taking part in more than one of our studies. We predicted that past-focused climate messages would be effective in promoting proenvironmental attitudes and behaviors among conservatives. All

studies were covered under Institutional Review Board approval from the Social Cognition Center Cologne, and participants provided consent by clicking a box on the first page of each study.

Methods and Results

Study 1.

Method. In study 1, participants were randomly assigned to read a message about climate change that drew a comparison either between the present and the future (future-focused, e.g., "Looking forward to our nation's future ... there is increasing traffic on the road") or between the present and the past (past-focused; e.g., "Looking back to our nation's past ... there was less traffic on the road"). Participants were told that a previous participant wrote the message in response to a prompt asking the participant to describe a current social issue. We also randomly varied whether the ostensible participant self-reported as a liberal or conservative and treated this variable as a between-subjects factor in our analyses. After reading

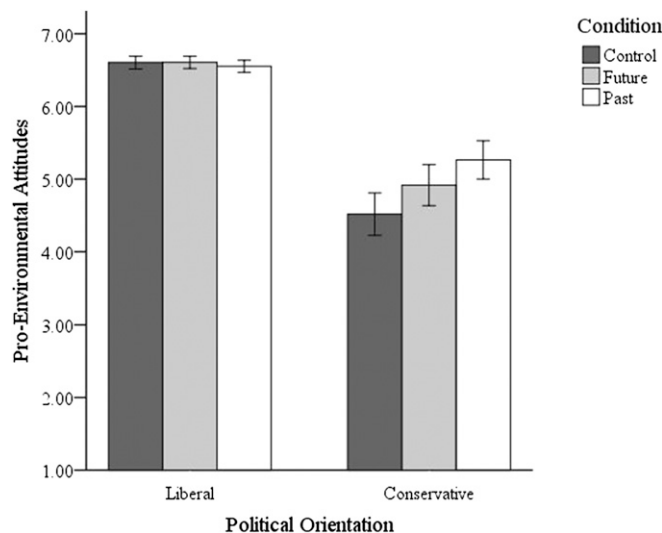


Fig. 2. Study 2. A past-focused message (white bars) is most effective in improving conservatives' proenvironmental attitudes. Temporal focus does not affect liberals' attitudes. Error bars represent SEs.

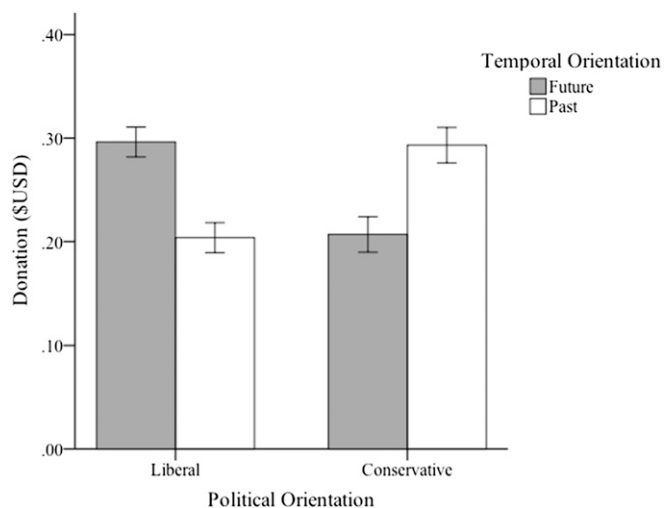


Fig. 5. Study 6. Conservatives donate more to the past-focused charity than to the future-focused charity, while the opposite is the case for liberals. Error bars represent SEs.

Study 4b.

Method. In study 4b we used two charities from study 4a as stimuli to demonstrate that temporal focus can influence liberals' and conservatives' donation behaviors. Participants were offered \$2 windfall money and were provided with links to the most past-focused and most future-focused charities from study 4a. They were asked to visit the two websites and decide how much of the money to donate to those charities and how much to keep for themselves.

Results. As expected, conservatives gave less than liberals to the future-focused charity ($P = 0.0002$, $d = 0.60$) (Fig. 4). However, this difference was attenuated and was not statistically significant for the past-focused charity ($P = 0.17$). Moreover, conservatives gave more to the past-focused charity than to the future-focused charity ($P = 0.03$, $d = 0.31$) whereas liberals gave equally to each charity [$P = 0.90$; interaction $F(1, 157) = 2.51$, $P = 0.12$]; detailed methods and results can be found in *SI Methods and Results, Study 4b*.

Study 5.

Method. The aim of study 5 was to isolate further the effects of temporal comparisons on donation behavior by using the procedure in study 5 but randomly presenting participants with only one website, either the past-focused charity or the future-focused charity from study 4b or a nonenvironmental control charity (cancer research). Participants were given \$2 windfall money and were asked to donate as much or as little to the charity as they chose, while keeping the rest for themselves.

Results. When comparing donations among conservatives and liberals separately, we found that conservatives gave more to the past-focused charity than to the future-focused charity ($P = 0.03$, $d = 0.38$) and more to the cancer research charity than to the future-focused charity ($P = 0.03$, $d = 0.60$) (Fig. S2). Conservatives did not differ in their donations to the past-focused and cancer research charities ($P = 0.34$). Liberals' donations to each of the three charities did not differ significantly (past- vs. future-focused, $P = 0.20$; past-focused vs. cancer, $P = 0.10$; future-focused vs. cancer, $P = 0.70$).

When comparing conservatives and liberals within each charity condition, we found that conservatives donated more than liberals to the cancer charity ($P = 0.02$, $d = 0.40$) but less than liberals to the future-focused charity ($P = 0.18$, $d = 0.40$), although this effect did not reach conventional levels of significance. Conservatives and liberals donated equally to the past-focused charity [$P = 0.72$; interaction $F(2, 395) = 3.40$, $P = 0.03$]. Detailed methods and results can be found in *SI Methods and Results, Study 5*.

Study 6.

Method. To increase experimental control and overcome the issue that the charities used in studies 4b and 5 inevitably differed in ways other than their temporal focus, we created two ostensible charities in study 6 and experimentally manipulated the temporal comparison. One charity communicated a past comparison ("Restoring the planet to its original state"), and the other communicated a future comparison ("Creating a new earth for the future") (Fig. S3). Participants were shown the logos and mission statements of each charity and then were asked to allocate \$0.50 to the charities.

Results. When comparing monetary allocations among conservatives and liberals separately, we found that conservatives distributed more to the past-focused charity than to the future-focused charity ($P = 0.009$, $d = 0.27$). Conversely, liberals distributed more to the future-focused charity than to the past-focused charity ($P = 0.002$, $d = 0.31$). When comparing conservatives and liberals' allocation tendencies, we found that conservatives distributed more than liberals to the past-focused charity ($P < 0.0001$, $d = 0.58$). Conversely, liberals distributed more than conservatives to the future-focused charity [$P < 0.0001$, $d = 0.58$; interaction $F(1, 192) = 16.13$, $P < 0.0001$] (Fig. 5). Detailed methods and results can be found in *SI Methods and Results, Study 6*.

Study 7: Meta-Analysis. We were interested in quantifying the size of the effect of political orientation on proenvironmental attitudes and behaviors as a function of temporal comparison across our studies. To this end, we submitted effect sizes from all studies (with the exception of 4a) to a mixed-effects meta-analysis. Although conservatives were less proenvironmental than liberals overall ($d = -0.54$, $P < 0.001$), this difference was modified by temporal comparison ($\beta = 0.64$, $P = 0.01$). Conservatives were less proenvironmental than liberals in the future-focused and control conditions ($d = -0.82$, $P < 0.0001$), but this difference was attenuated and was no longer statistically significant in the past-focused conditions ($d = -0.19$, $P = 0.35$). Past comparisons largely bridged the political divide in addressing global warming and climate change observed in the future-focused and control conditions.

Discussion

Conservative ideology emerged from a resistance to progressive change, and thus a central feature of conservatives' psychology is a preference for the past over the future. On this basis, we predicted and found that past-focused environmental comparisons are more effective in convincing conservatives of the need to act against climate change. In fact, the meta-analysis showed that past comparisons bridged the political gap in our studies by 77% on average. In some cases, the political divide was even reversed—conservatives liked past-focused environmental appeals more than liberals did (study 1) and allocated more money than liberals to past-focused environmental charities (study 6). One limitation of this research is that we relied on relatively small samples drawn from Amazon MTurk. We welcome research to replicate these findings in a large-scale, nationally representative sample. Doing so also would be helpful in determining how large an impact a temporal-framing intervention could have in a naturalistic setting.

Our findings align with a strong tradition in social psychology and social cognition demonstrating the influence of framing on attitudes. Even subtle differences in framing can mean the difference between acceptance and rejection of a message (28). Messages that are supported by scientific evidence are especially effective when acceptance of the message also means that one's personal values can be upheld (29, 30). Messages concerning global warming and climate change are no exception: They need to be tailored with great care (31–33). Indeed, over the last several years the message of climate change has been framed in many ways—from fatalistic predictions about the future to calls for social progress (33). However, our research suggests that these messages will not be as effective in bridging the political divide if they continue to make future-focused comparisons. Paradoxically, it is the past that may be critical in saving the future.

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1. Anderegg WR, Prall JW, Harold J, Schneider SH (2010) Expert credibility in climate change. *Proc Natl Acad Sci USA* 107(27):12107–12109.
2. Van Liere KD, Dunlap RE (1980) The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence. *Public Opin Q* 44(2):181–197.
3. McCright AM, Dunlap RE (2011) The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *Public Opin Q* 52(2):155–194.
4. Fielding KS, Head BW, Laffan W, Western M, Hoegh-Guldberg O (2012) Australian politicians' beliefs about climate change: Political partisanship and political ideology. *Env Polit* 21(5):712–733.
5. Gromet DM, Kunreuther H, Larrick RP (2013) Political ideology affects energy-efficiency attitudes and choices. *Proc Natl Acad Sci USA* 110(23):9314–9319.
6. Huntington S (1957) Conservatism as an ideology. *Am Polit Sci Rev* 51(2):454–473.
7. Kirk R (2001) *The Conservative Mind: From Burke to Eliot* (Regnery Publishing, London).
8. Burke E (1790) *Reflections on the Revolution in France* (James Dodsley, London).
9. Muller JZ (1997) *Conservatism: An Anthology of Social and Political Thought from David Hume to the Present* (Princeton Univ Press, Princeton, NJ).
10. Jost JT, Glaser J, Kruglanski AW, Sulloway FJ (2003) Political conservatism as motivated social cognition. *Psychol Bull* 129(3):339–375.
11. Robinson MD, Cassidy DM, Boyd RL, Fetterman AK (2015) The politics of time: Conservatives differentially reference the past and liberals differentially reference the future. *J Appl Soc Psychol* 45(7):391–399.
12. Stern BB (1992) Historical and personal nostalgia in advertising text: The fin de siècle effect. *J Advert* 21(4):11–22.
13. Wilson JL (2005) *Nostalgia: Sanctuary of Meaning* (Bucknell Univ Press, Lewisburg, PA).
14. Pew Research Center (2016) Campaign exposes fissures over issues, values and how life has changed in the U.S. Available at www.people-press.org/2016/03/31/campaign-exposes-fissures-over-issues-values-and-how-life-has-changed-in-the-u-s/. Accessed November 21, 2016.
15. Gallup J 2015, Majority say moral values getting worse. Available at www.gallup.com/poll/183467/majority-say-moral-values-getting-worse.aspx. Accessed November 21, 2016.
16. United Nations (2011) *Press Release: Secretary-General Urges Governments to Take Long-term View on Renewable Energy, Spelling Out Priorities at 'Clean Industrial Revolution' Event in Durban*. Available at <https://www.un.org/press/en/2011/sgsm13998.doc.htm>. Accessed May 4, 2016.
17. Guggenheim D (2006) *An inconvenient truth: A global warning* [DVD]. (Paramount, Hollywood, CA).
18. Gauchat G (2012) Politicization of science in the public sphere: A study of public trust in the United States, 1974 to 2010. *Am Sociol Rev* 77(2):167–187.
19. Wolsko C, Ariceaga H, Seiden J (2016) Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors. *J Exp Soc Psychol* 65:7–19.
20. Feinberg M, Willer R (2013) The moral roots of environmental attitudes. *Psychol Sci* 24(1):56–62.
21. Campbell TH, Kay AC (2014) Solution aversion: On the relation between ideology and motivated disbelief. *J Pers Soc Psychol* 107(5):809–824.
22. Kahan DM, Jenkins-Smith H, Braman D (2011) Cultural cognition of scientific consensus. *J Risk Res* 14(2):147–174.
23. Buhrmester M, Kwang T, Gosling SD (2011) Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspect Psychol Sci* 6(1):3–5.
24. Clifford S, Jewell RM, Waggoner PD (2015) Are samples drawn from Mechanical Turk valid for research on political ideology? *Research & Politics* 2:1–9.
25. Huff C, Tingley D (2015) "Who are these people?" Evaluating the demographic characteristics and political preferences of MTurk survey respondents. *Research & Politics* 2:1–12.
26. Berinsky AJ, Huber GA, Lenz GS (2012) Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk. *Polit Anal* 20:351–368.
27. Chandler J, Paolacci G, Peer E, Mueller P, Ratliff KA (2015) Using nonnaive participants can reduce effect sizes. *Psychol Sci* 26(7):1131–1139.
28. Tversky A, Kahneman D (1981) The framing of decisions and the psychology of choice. *Science* 211(4481):453–458.
29. Cohen GL, Aronson J, Steele CM (2000) When beliefs yield to evidence: Reducing biased evaluation by affirming the self. *Pers Soc Psychol Bull* 26(9):1151–1164.
30. Lakoff G (2010) *Moral Politics: How Liberals and Conservatives Think* (Univ of Chicago Press, Chicago).
31. Rowson J (December 2013) A new agenda on climate change. *J R Soc Arts*. Available at <https://www.thersa.org/discover/publications-and-articles/reports/a-new-agenda-on-climate-change>. Accessed November 21 2016.
32. Schuldt JP, Konrath SH, Schwarz N (2011) "Global warming" or "climate change"? Whether the planet is warming depends on question wording. *Public Opin Q* 75:115–124.
33. Nisbet MC (2009) Communicating climate change: Why frames matter for public engagement. *Env: Sci and Pol for Sus Dev* 51(2):12–23.
34. Preacher KJ, Rucker DD, Hayes AF (2007) Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behav Res* 42(1):185–227.
35. McGregor I, Zanna MP, Holmes JG, Spencer SJ (2001) Compensatory conviction in the face of personal uncertainty: going to extremes and being oneself. *J Pers Soc Psychol* 80(3):472–488.
36. Dunlap RE, Van Liere KD, Mertig AG, Jones RE (2000) Measuring endorsement of the new ecological paradigm: A revised NEP scale. *J Soc Issues* 56(3):425–442.
37. Roets A, Van Hiel A (2011) Item selection and validation of a brief, 15-item version of the need for closure scale. *Per and Ind Diff* 50(1):90–94.
38. Borenstein M, Hedges LV, Higgins JPT, Rothstein HR (2009) *Introduction to Meta-Analysis* (John Wiley & Sons, Ltd, Chichester, UK).
39. Viechtbauer W (2010) Conducting meta-analyses in R with the metafor package. *J Stat Softw* 36(3):1–48.
40. Lipsey MW, Wilson DB (2001) *Practical Meta-Analysis* (Sage, Thousand Oaks, CA).
41. Simonsohn U, Nelson LD, Simmons JP (2014) P-curve: A key to the file-drawer. *J Exp Psychol Gen* 143(2):534–547.