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Cite this article: DeScioli P, Massenkoff M, Shaw A, Petersen MB, Kurzban R. 2014 Equity or equality? Moral judgments follow the money. *Proc. R. Soc. B* **281**: 20142112. <http://dx.doi.org/10.1098/rspb.2014.2112>

Received: 25 August 2014

Accepted: 26 September 2014

Subject Areas:

cognition, behaviour

Keywords:

morality, fairness, evolutionary psychology

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Electronic supplementary material is available at <http://dx.doi.org/10.1098/rspb.2014.2112> or via <http://rspb.royalsocietypublishing.org>.

Equity or equality? Moral judgments follow the money

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Previous research emphasizes people's dispositions as a source of differences in moral views. We investigate another source of moral disagreement, self-interest. In three experiments, participants played a simple economic game in which one player divides money with a partner according to the principle of equality (same payoffs) or the principle of equity (payoffs proportional to effort expended). We find, first, that people's moral judgment of an allocation rule depends on their role in the game. People not only prefer the rule that most benefits them but also judge it to be more fair and moral. Second, we find that participants' views about equality and equity change in a matter of minutes as they learn where their interests lie. Finally, we find limits to self-interest: when the justification for equity is removed, participants no longer show strategic advocacy of the unequal division. We discuss implications for understanding moral debate and disagreement.

1. Introduction

People frequently disagree about morality. They disagree about which rules are valid such as whether contraception [1] or interest-bearing loans [2] are morally wrong. They disagree about which rules apply such as whether progressive taxation is stealing or abortion is murder. And they disagree about which rules take priority such as whether altruism justifies dishonesty [3].

Previous research emphasizes *dispositions* as a source of moral disagreement. Haidt [4] reviewed evidence that differences in personality and genes are correlated with liberal and conservative ideology. For instance, liberalism is associated with openness to experience, whereas conservatism is associated with fear of change [5]. In turn, ideology is connected to moral judgment: liberals focus on harm, liberty and fairness, whereas conservatives give greater weight to authority, loyalty and purity. Relevant to the present studies, Haidt [4] reports that liberals prioritize equality of outcomes over equity—proportionality between inputs and benefits [6,7], whereas conservatives show the reverse pattern. Similarly, Lakoff [8] argued that liberals and conservatives emphasize different metaphors for society (nurturant parent or strict father) which leads to conflicting judgments. In the realm of fairness, Lakoff argued that 'conservatives and liberals agree that Moral Action Is Fair Distribution, but they disagree strongly about what counts as fair distribution' (pp. 61–62).

Another potential source of moral disagreement is self-interest. Many moral rules have different consequences for different groups of people in society. To take a modern example, prohibitions against copying music and movies have different effects on producers and consumers, explaining why they judge copying as stealing or sharing, respectively. History is replete with similar examples. Robinson & Acemoglu [9] discuss a type of limited-liability contract, the *commenda*, devised in mediaeval Venice to finance maritime trade. Some merchants used these contracts to gain wealth and power, and then sought to criminalize them to prevent others from achieving the same success. But,

it is unknown whether strategic advocacy occurs only in exceptional circumstances or is part of the routine operation of moral judgment. Indeed, political scientists argue that most people *do not* systematically advocate policies that benefit them ([10,11], but see [12]).

However, evolutionary theories give reasons to suspect that moral judgment is routinely strategic [13–19]. Human societies have many moral rules and new ones are frequently invented. Inevitably, some rules will benefit some people more than others. That is, a panoply of moral rules with differential effects is part of the enduring social ecology of *Homo sapiens*. Natural selection might have favoured cognitive adaptations for advocating rules that enhance the individual's fitness [20,21]. This might be why people experience moral debates as so compelling and emotionally provocative. Moreover, people believe their own moral judgments are universal and objective, and they try to persuade dissenters to switch to their moral views [22–24]. From a biological perspective, these elaborate efforts are wasted if they are not tied to the consequences of different rules.

Importantly, the strategic account does not hold that moral judgment is *the same as* expressing self-interest. If it were, then there would be no room for debate because attempts to change other people's moral judgments would be futile. If, however, moral judgment has an element of *coordination*—both sides benefit from agreement in addition to their payoffs for each choice itself—then there is room for negotiation [17]. The need for coordination implies that people seek moral rules which, in addition to being self-serving, other people will find persuasive. For instance, people might prefer rules that are psychologically *salient* to capture other people's attention, and *impartial*, applying to everyone independent of their identity, because these characteristics facilitate coordination [25]. In short, strategic moral judgment favours rules that benefit oneself, subject to the constraints of coordination—the rules must be ones that at least some other group members might also support.

The benefits of coordination can explain why a receiver, even an adversary, pays attention to an individual's moral judgments. Models of the evolution of communication show that signalling occurs when both senders and receivers benefit, on average, from exchanging messages [26,27]. Moral judgments can be understood in this framework because they are not only private but are frequently communicated to other people. Both senders and receivers of moral signals can benefit if their payoffs depend, in part, on agreeing with each other. For example, a buyer and seller both benefit from agreeing on a fair price because this allows the deal to proceed. By contrast, if they both insist on maximizing their own profits, then the deal fails and no one earns profits. By listening to each other's moral arguments, people can find profitable compromises and avoid the costs of escalating conflicts. Even so, people are expected to bias their moral arguments within these constraints just as professional negotiators are expected to drive a hard bargain.

(a) Previous research

Several lines of previous research show biased moral judgment including work on hypocrisy, motivated moral reasoning and partiality. Although these lines of work are relevant to our

central interest—strategic advocacy of moral rules—they each make claims that differ from our animating thesis. First, research on moral hypocrisy focuses on the difference between moral judgment and actual behaviour. This work shows that people's behaviour is often inconsistent with their moral judgments [28]. This research does not attempt to explain why people's moral judgments differ from one another.

Second, previous work shows moral partiality: people apply moral rules more leniently to individuals they like more. For example, participants judged a librarian's moral character more positively when the librarian forgave the participant's fine [29]. This work on character judgments does not aim to understand judgments about moral principles themselves.

Third, the literature on motivated moral reasoning [30] shows that people alter judgments about facts, causes, intentions and harm to support their moral conclusions [4,31]. For example, Knobe [32] found that participants judge a chief executive officer's actions that harm the environment as a side-effect to be intentional even though they judge analogous positive effects to be unintentional. This research shows biased reasoning to favour initial moral conclusions. It does not attempt to address the initial sources of moral judgments themselves and hence disagreement about moral rules.

Last, Uhlmann *et al.* [33] found that people selectively apply deontic or consequentialist moral rules to achieve consistency with their other values about prejudice and racism. This is similar to the present work because it focuses on people's endorsements of alternative moral principles. However, this research did not attempt to manipulate participants' direct interests, instead relying on participants' pre-existing values about prejudice. By contrast, the present experiments directly manipulate self-interest by using cash in an economic game.

(b) The present experiments

One prominent moral disagreement is the opposition between equality and equity. We use the term *equality* to refer to equal payoffs and the term *equity* to refer to payoffs proportional to inputs [6,7]. These two principles can be in conflict. If people contribute different amounts of effort to produce goods, then the spoils can be divided equally or in proportion to their efforts. Both allocation rules are psychologically salient and both are impartial because they are independent of identities. These features might explain why this particular opposition is among the most persistent moral disagreements across societies. In modern politics, for instance, public opposition to welfare programmes is driven by perceived deservingness—an equity concept—whereas welfare supporters seek greater equality [34–37].

In the present experiments, we test the strategic morality hypothesis against the alternative that moral disagreement mainly reflects stable differences in dispositions. In particular, we examine whether participants' judgments of equality and equity depend on which rule yields more benefits for them. We use an economic game in which the experimenter directly controls the benefits (cash) that participants receive from equality and equity divisions. The main dependent measure is not the division itself but participants' judgments of fairness and morality for each allocation rule. These judgments do not directly affect

payoffs in the experiment (they occur after the allocation decision). Hence, strategic judgment in this context does not reflect explicit goals to gain cash but instead implicit goals to advocate self-serving moral rules.

If participants' judgments about equality and equity are explained exclusively by stable dispositions based on different genes, development, personality, metaphors, social identities, political affiliations and so on, then their personal benefits will not affect moral judgment. If moral judgment is routinely strategic and favours self-serving rules, then participants will align judgments with their interests.

2. Experiment 1

(a) Methods

We recruited participants to complete a short (approx. 8 min) online study for payment using Amazon's Mechanical Turk website [38–40]. Participants who failed a comprehension check were excluded ($n = 29$) yielding a final sample of $n = 90$ participants (56% female; age: $M = 32$, $s.d. = 10$).

We designed an economic game to create a conflict between two values: equality and equity. The game is equivalent to a dictator game [41], in which one player decides how much money to transfer to another player. Players earn an endowment of money by working together to transcribe text. One player, the Typist, transcribes three paragraphs and the other player, the Checker, transcribes one of the same three paragraphs (the Typist does not know which paragraph will be checked). The rationale is that the Checker's paragraph is used to check the Typist's work for accuracy but for this purpose only a sample paragraph is needed. If the Checker's paragraph matches the Typist's paragraph, then the two players together earn a bonus of \$2. The Typist decides how to divide these potential earnings. The Typist can divide the money equally, 50% Typist and 50% Checker, or according to the work they each contributed, three paragraphs for the Typist and one paragraph for the Checker yielding a division of 75% Typist and 25% Checker. Hence, the Typist's decision involves a conflict between equality and equity.

Participants were randomly assigned to one of two roles, Typist or Checker. Participants read instructions describing the transcription task and the Typist's options for dividing the money. Next, their role was revealed, they completed their part of the transcription task, and Typists made their allocation decision. Then, participants judged the fairness and morality of each of the Typist's options, the equal division of 50%/50% and the equitable division of 75%/25%. For example, participants answered 'In your opinion, do you think it is fair or unfair to divide the earnings according to roles based on the amount of work, 75% for the Typist and 25% for the Checker?' They rated unfairness on a numberless sliding scale with 'very fair' and 'very unfair' at the endpoints and 'neutral' at the midpoint. For the moral judgments, the endpoints were 'very morally justified' and 'very morally wrong'. For all four items, the position of the slider was recorded on a scale from 5 (very fair/morally justified) to -5 (very unfair/morally wrong) that was not observed by participants. Finally, participants provided open-ended comments, answered comprehension questions and entered demographic information.

The main experimental hypothesis concerns participants' fairness and moral judgments. The strategic morality hypothesis predicts that participants randomly assigned to be Typists will rate equity to be more fair and moral than participants in the Checker role, whereas the reverse will be observed for equality. By contrast, the dispositional morality hypothesis does not predict an effect of role.

(b) Results and discussion

We found that 81% of Typists chose the equitable division rather than the equal division. Participants' fairness and morality judgments depended on their role. Typists judged the equitable division to be more fair ($M = 3.27$, $s.d. = 2.05$) than Checkers ($M = 0.80$, $s.d. = 3.17$), $t_{88} = 4.27$, $p < 0.001$. Similarly, Typists judged the equitable division to be more moral ($M = 3.29$, $s.d. = 2.73$) than Checkers ($M = 1.28$, $s.d. = 2.78$), $t_{88} = 3.99$, $p < 0.001$.

Judgments about the equal division showed the opposite pattern. Checkers judged the equal division to be more fair ($M = 1.96$, $s.d. = 2.36$) than Typists ($M = -0.11$, $s.d. = 3.16$), $t_{88} = 3.52$, $p < 0.001$. Similarly, Checkers judged the equal division to be more moral ($M = 2.06$, $s.d. = 2.33$) than Typists ($M = 0.93$, $s.d. = 2.73$), $t_{88} = 2.11$, $p < 0.05$.

In summary, we find support for the strategic morality hypothesis. Participants judgments about alternative moral rules depended on the monetary benefits they received from each rule owing to their role as Typist or Checker. The present results do not allow us to determine whether Typists, Checkers or players in both roles changed their judgments. We examine this issue in experiment 2.

3. Experiment 2

(a) Methods

We recruited participants on Mechanical Turk. Participants who failed a comprehension check were excluded ($n = 36$) yielding a final sample of $n = 97$ participants (56% female; age: $M = 32$, $s.d. = 11$).

The procedure and stimuli were the same as experiment 1 except participants made fairness and moral judgments about each division both before they knew their role as Typist or Checker as well as after knowing their role as in experiment 1. This allowed us to observe changes in fairness and moral judgments in response to participants learning their roles. In this pre- and post-test design, participants could be motivated to appear consistent in their before and after judgments. To minimize these effects, participants responded on a numberless sliding scale that makes it impossible to remember exactly how fair or moral they previously judged a division. Further, we instructed participants for the second round of judgments that 'It is ok if your judgments have changed or if they are the same as before'.

(b) Results and discussion

We found that 72% of Typists chose the equitable division rather than the equal division. Table 1 reports participants' judgments before and after knowing their role and paired t -tests for the pre-post differences. We find significant changes in seven out of eight cases (the exception is Checker's fairness judgments of the equitable division). Moreover,

Table 1. Fairness and moral judgments, experiment 2. (Participants judgments before and after they learned their role as Typist or Checker. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.)

	before		after		change	paired <i>t</i>
	<i>M</i>	s.d.	<i>M</i>	s.d.		
Typist						
fairness of equitable division	2.40	2.51	3.26	2.14	0.86	3.18**
fairness of equal division	0.60	2.93	−0.53	3.23	−1.12	3.06**
morality of equitable division	2.47	2.03	3.10	1.79	0.63	4.20***
morality of equal division	1.21	2.55	0.16	2.92	−1.04	3.37**
Checker						
fairness of equitable division	1.63	2.85	1.29	2.78	−0.33	0.78
fairness of equal division	1.03	2.89	1.86	2.34	0.83	2.60*
morality of equitable division	1.97	2.20	1.26	2.73	−0.72	2.41*
morality of equal division	1.55	2.27	2.15	2.13	0.60	2.41*

all seven significant changes are in the direction predicted by the strategic morality hypothesis. After their role is revealed, Typists view the equitable division as more fair and moral and the equal division as less fair and moral. By contrast, Checkers view the equitable division as less moral (no difference for fairness) and the equal division as more fair and moral.

4. Experiment 3

Experiment 3 tests whether moral judgment is purely self-interested or is constrained by a strategic need for justifications that could plausibly persuade other people to agree. We repeat experiment 2 except both players contribute the same work, removing the equity justification for an unequal division.

(a) Methods

We recruited participants on Mechanical Turk. Participants who failed a comprehension check were excluded ($n = 103$) yielding a final sample of $n = 96$ participants (58% female; age: $M = 39$, s.d. = 13). (Owing to the number of exclusions, we also analysed the data with less restrictive exclusion criteria and found the same pattern of results; see the electronic supplementary material, appendix.)

The procedure and stimuli were the same as experiment 2 except both the Typist and Checker transcribed one paragraph. This was designed to remove the Typist's equity justification for choosing the 75%/25% division. Typists and Checkers both transcribed one paragraph and were informed that they would complete identical amounts of work. To match this design, the 75%/25% division was described as dividing the money 'according to roles' instead of 'according to roles based on amount of work'.

With the equity justification removed, pure and strategic self-interest make different predictions. If Typists are purely self-interested, then they will nonetheless take 75% and alter their moral judgments to favour this division. However,

if Typists selectively favour moral rules only when plausible justifications are available, then self-interested moral judgment will be diminished by removing the equity justification.

(b) Results and discussion

We found that 22% of Typists chose the self-interested unequal division rather than the equal division. This is in stark contrast to experiments 1 and 2 in which 81% and 72% of Typists, respectively, chose the self-interested division. This observation indicates that Typists' self-interested behaviour is constrained by the availability of an equity justification for taking a disproportionate share of the reward.

Table 2 shows participants' fairness and moral judgments before and after learning their role. Typists showed no significant changes in judgments after learning their role and completing the task (table 2). This is consistent with the strategic morality hypothesis and shows that removing the equity justification diminished self-interested moral judgment. By contrast, Checkers significantly altered their moral and fairness judgments after learning their role for three out of four of the measures, and these three changes were in the self-interested direction. We suggest that the difference between Checkers and Typists is that the former are passively affected by the latter's decision. Hence, Checkers might still have a need for defensive moral and fairness judgments which might explain why Checkers changed their decisions and Typists did not.

5. General discussion

We find that people's judgments about the fairness and morality of a rule depends on their self-interest. People who contribute less work judge equality as more fair and moral. People who contribute more work judge equity as more fair and moral. Furthermore, people's judgments are flexible and readily shift. In the few minutes between reading the game instructions and discovering their own role—and hence, where their interests lie—people's reported

Table 2. Fairness and moral judgments, experiment 3. (Participants judgments before and after they learned their role as Typist ($n = 45$) or Checker ($n = 51$). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.)

	before		after		change	paired t
	M	s.d.	M	s.d.		
Typist						
fairness of unequal division	-1.93	3.17	-1.93	3.17	-0.01	0.02
fairness of equal division	3.41	2.49	3.10	2.52	-0.31	0.75
morality of unequal division	-1.00	2.58	-1.10	2.91	-0.10	0.43
morality of equal division	3.24	2.03	3.13	2.14	-0.11	0.54
Checker						
fairness of unequal division	-1.63	3.01	-2.95	2.29	-1.32	3.02***
fairness of equal division	3.35	2.35	3.96	1.80	0.61	1.77
morality of unequal division	-0.67	2.54	-1.93	2.34	-1.25	3.57***
morality of equal division	2.95	2.27	3.55	1.82	0.59	2.24*

moral judgments changed in line with their self-interest. Last, self-interest is tempered by the availability of justifications. When we removed the equity justification, self-serving advocacy of the unequal division no longer occurred.

These results speak to the psychological causes of disagreement about moral rules. The dispositional perspective holds that people's moral views originate from deeply held principles based on personality, genes and other individual differences [4,5,8]. According to this perspective, motivated moral reasoning favours these primary principles, but the principles themselves arise from dispositions. This account predicts that moral judgments are stable and fixed, especially because they are insulated from change by motivated reasoning.

The present findings show not only that self-interest shapes moral values but also that it can influence judgment over very short time spans. Prior work suggests that long-term interests influence moral positions on issues such as abortion [42,43] and drug use [44]. In the present work, we directly manipulate participants' self-interest by using an economic game with cash incentives. The results reveal that moral judgment can quickly change (approx. 5 min) to track an individual's interests. Importantly, this observation does not necessarily undermine the idea that people's moral views are in some sense foundational, forming the basis of judgments on many particular issues. However, people can also strategically adjust these initial views to benefit themselves.

The strategic model can extend the explanatory reach of previous dispositional theories. For example, research shows that libertarians in the United States tend to be more socially isolated [45]. A dispositional perspective cannot address why this relationship exists or whether it will persist outside of the United States. By contrast, a strategic perspective asks how socially isolated people might benefit from their libertarian values, and how this relationship might change across cultural, political and economic contexts. According to the strategic model, the same psychological disposition can lead to very different political views depending on people's incentives.

Future research can examine the role of strategic advocacy surrounding equality and equity in American and comparative politics. Political disagreements over these principles might be caused in part by differences in perceived self-interest, even if these perceptions are inaccurate. For example, a working class individual might benefit from equity within their small social circle and then incorrectly perceive the same rule to be in their political interest even though equality would bring them greater payoffs. We note that self-interest includes not only economic but also social payoffs. For instance, a wealthy liberal person might improve their reputation among peers by advocating equality which could outweigh its negative effects on their income.

We suspect that strategic motives extend beyond fairness into other moral domains such as purity and authority. The political sphere offers suggestive observations. For example, in 2013 Senator Portman (R-Ohio) publically reversed his previous opposition to same-sex marriage. The Senator wrote: 'Knowing that my son is gay prompted me to consider the issue from another perspective: that of a dad who wants all three of his kids to lead happy, meaningful lives' [46]. That is, his change of heart was not initiated by new principles but instead by how policies against same-sex marriage negatively affect his own son. This example suggests that a variety of moral domains and political issues might be connected to perceived interests.

In conclusion, we suggest that the human mind includes not only basic moral values but also the ability to strategically advocate for the moral principles that most benefit us. This pursuit of self-interest is tempered, however, by the constraints of coordination. People seek not only to benefit themselves but also to persuade other people that they are morally right in doing so.

Ethics statement. The study procedures were approved by the Institutional Review Board at Stony Brook University.

Data accessibility. The data are available as electronic supplementary material for this article.

References

- Riddle JM. 1997 *Eve's herbs: a history of contraception and abortion in the West*. Cambridge, MA: Harvard University Press.
- Bentham J. 1952 A defence of usury. In *Jeremy Bentham's economic writings* (ed. W Stark), pp. 121–208. London, UK: Allen and Unwin. (Original work published 1787).
- Kant I. 1993 *Grounding for the metaphysics of morals* (transl. JW Ellington). Indianapolis, IN: Hackett. (Original work published 1785).
- Haidt J. 2012 *The righteous mind*. New York, NY: Vintage Books.
- Jost JT, Glaser J, Kruglanski AW, Sulloway FJ. 2003 Political conservatism as motivated social cognition. *Psychol. Bull.* **129**, 339–375. (doi:10.1037/0033-2909.129.3.339)
- Adams J. 1965 Inequity in social exchange. In *Advances in experimental social psychology*, vol. 2 (ed. L Berkowitz), pp. 267–299. New York, NY: Academic Press.
- Walster E, Walster GW, Berscheid E. 1978 *Equity theory and research*. Boston, MA: Allyn and Bacon.
- Lakoff G. 2002 *Moral politics*. Chicago, IL: University of Chicago Press.
- Robinson AD, Acemoglu R. 2012 *Why nations fail*. New York, NY: Crown.
- Kinder DR. 1998 Opinion and action in the realm of politics. In *Handbook of social psychology* (eds D Gilbert, S Fisk, G Lizey), pp. 778–867. New York, NY: McGraw-Hill.
- Sears DO, Lau RR, Tyler TR, Allen Jr HM. 1980 Self-interest vs. symbolic politics in policy attitudes and presidential voting. *Am. Political Sci. Rev.* **74**, 670–684. (doi:10.2307/1958149)
- Kurzban R, Leary MR. 2014 *The hidden agenda of the political mind*. Princeton, NJ: Princeton University Press.
- Alexander RD. 1987 *The biology of moral systems*. New York, NY: Aldine de Gruyter.
- Daly M, Wilson M. 1988 *Homicide*. New York, NY: Aldine de Gruyter.
- DeScioli P, Bruening R, Kurzban R. 2011 The omission effect in moral cognition: toward a functional explanation. *Evol. Hum. Behav.* **32**, 204–215. (doi:10.1016/j.evolhumbehav.2011.01.003)
- DeScioli P, Christner J, Kurzban R. 2011 The omission strategy. *Psychol. Sci.* **22**, 442–446. (doi:10.1177/0956797611400616)
- DeScioli P, Kurzban R. 2013 A solution to the mysteries of morality. *Psychol. Bull.* **139**, 477–496. (doi:10.1037/a0029065)
- Petersen MB. 2013 Moralization as protection against exploitation: do individuals without allies moralize more? *Evol. Hum. Behav.* **34**, 78–85. (doi:10.1016/j.evolhumbehav.2012.09.006)
- Shaw A. 2013 Beyond 'To share or not to share': the impartiality account of fairness. *Curr. Dir. Psychol. Sci.* **22**, 413–417. (doi:10.1177/0963721413484467)
- Mercier H, Sperber D. 2011 Why do humans reason? Arguments for an argumentative theory. *Behav. Brain Sci.* **34**, 57–74. (doi:10.1017/S0140525X10000968)
- Mercier H. 2011 What good is moral reasoning? *Mind Soc.* **10**, 131–148. (doi:10.1007/s11299-011-0085-6)
- Goodwin GP, Darley JM. 2008 The psychology of meta-ethics: exploring objectivism. *Cognition* **106**, 1339–1366. (doi:10.1016/j.cognition.2007.06.007)
- Haidt J, Rosenberg E, Hom H. 2003 Differentiating diversities: moral diversity is not like other kinds. *J. Appl. Soc. Psychol.* **33**, 1–36. (doi:10.1111/j.1559-1816.2003.tb02071.x)
- Turiel E. 1998 The development of morality. In *Handbook of child psychology: social, emotional, and personality development*, vol. 3 (eds W Damon, N Eisenberg), pp. 863–932, 5th edn. Hoboken, NY: Wiley.
- Schelling TC. 1960 *The strategy of conflict*. Cambridge, MA: Harvard University Press.
- Dawkins R, Krebs JR. 1978 Animal signals: information or manipulation? In *Behavioral ecology* (eds JR Krebs, NB Davies), pp. 282–309. Sunderland, MA: Sinauer Associates.
- Maynard Smith J, Harper D. 2003 *Animal signals*. Oxford, UK: Oxford University Press.
- Batson CD, Thompson ER. 2001 Why don't moral people act morally? Motivational considerations. *Curr. Dir. Psychol. Sci.* **10**, 54–57. (doi:10.1111/1467-8721.00114)
- Bocian K, Wojciszke B. 2014 Self-interest bias in moral judgments of others' actions. *Pers. Soc. Psychol. Bull.* **40**, 898–909. (doi:10.1177/0146167214529800)
- Ditto PH, Pizarro DA, Tannenbaum D. 2009 Motivated moral reasoning. *Psychol. Learn. Motivation* **50**, 307–338. (doi:10.1016/S0079-7421(08)00410-6)
- Haidt J. 2001 The emotional dog and its rational tail: a social intuitionist approach to moral judgment. *Psychol. Rev.* **108**, 814–834. (doi:10.1037/0033-295X.108.4.814)
- Knobe J. 2005 Theory of mind and moral cognition: exploring the connections. *Trends Cogn. Sci.* **9**, 357–359. (doi:10.1016/j.tics.2005.06.011)
- Uhlmann EL, Pizarro DA, Tannenbaum D, Ditto PH. 2009 The motivated use of moral principles. *Judgment Decis. Mak.* **4**, 476–491.
- Feldman S, Zaller J. 1992 The political culture of ambivalence: ideological responses to the welfare state. *Am. J. Political Sci.* **36**, 268–307. (doi:10.2307/2111433)
- Fong C. 2001 Social preferences, self-interest, and the demand for redistribution. *J. Public Econ.* **82**, 225–246. (doi:10.1016/S0047-2727(00)00141-9)
- Gilens M. 1999 *Why Americans hate welfare: race, media, and the politics of antipoverty policy*. Chicago, IL: University of Chicago Press.
- Petersen MB. 2012 Social welfare as small-scale help: evolutionary psychology and the deservingness heuristic. *Am. J. Political Sci.* **56**, 1–16. (doi:10.1111/j.1540-5907.2011.00545.x)
- Buhrmester M, Kwang T, Gosling SD. 2011 Amazon's mechanical turk: a new source of inexpensive, yet high-quality, data? *Perspect. Psychol. Sci.* **6**, 3–5. (doi:10.1177/1745691610393980)
- DeScioli P, Kurzban R. 2009 The alliance hypothesis for human friendship. *PLoS ONE* **4**, e5802. (doi:10.1371/journal.pone.0005802)
- Horton JJ, Rand DG, Zeckhauser RJ. 2011 The online laboratory: conducting experiments in a real labor market. *Exp. Econ.* **14**, 399–425. (doi:10.1007/s10683-011-9273-9)
- Camerer C. 2003 *Behavioral game theory: experiments in strategic interaction*. Princeton, NJ: Princeton University Press.
- Betzig L, Lombardo LH. 1992 Who's pro-choice and why. *Ethol. Sociobiol.* **13**, 49–71. (doi:10.1016/0162-3095(92)90006-P)
- Weeden J. 2013 Genetic interests, life histories and attitudes towards abortion. PhD thesis, University of Pennsylvania, Philadelphia, PA, USA.
- Kurzban R, Dukes A, Weeden J. 2010 Sex, drugs and moral goals: reproductive strategies and views about recreational drugs. *Proc. R. Soc. B* **277**, 3501–3508. (doi:10.1098/rspb.2010.0608)
- Iyer R, Koleva S, Graham J, Ditto P, Haidt J. 2012 Understanding libertarian morality: the psychological dispositions of self-identified libertarians. *PLoS ONE* **7**, e42366. (doi:10.1371/journal.pone.0042366)
- Voorhees J. 2013 Rob Portman's gay-marriage reversal was prompted by his son coming out to him. Slate. See www.slate.com. (Accessed 15 March 2013).