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## Who Deserves Help? Evolutionary Psychology, Social Emotions, and Public Opinion about Welfare

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### Abstract

Evidence suggests that our foraging ancestors engaged in the small-scale equivalent of social insurance as an essential tool of survival and evolved a sophisticated psychology of social exchange (involving the social emotions of compassion and anger) to regulate mutual assistance. Here, we hypothesize that political support for modern welfare policies are shaped by these evolved mental programs. In particular, the compassionate motivation to share with needy nonfamily could not have evolved without defenses against opportunists inclined to take without contributing. Cognitively, such parasitic strategies can be identified by the intentional avoidance of productive effort. When detected, this pattern should trigger anger and down-regulate support for assistance. We tested predictions derived from these hypotheses in four studies in two cultures, showing that subjects' perceptions of recipients' effort to find work drive welfare opinions; that such perceptions (and not related perceptions) regulate compassion and anger (and not related emotions); that the effects of perceptions of recipients' effort on opinions about welfare are mediated by anger and compassion, independently of political ideology; and that these emotions not only influence the content of welfare opinions but also how easily they are formed.

### Keywords

evolutionary psychology; public opinion; social welfare; social emotions; social exchange

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When individuals form opinions about social welfare, a primary concern is whether welfare recipients *deserve* the benefits they receive (Cook & Barrett, 1992; Gilens, 1999; Iyengar, 1991; Larsen, 2006; Petersen, Slothuus, Stubager, & Togeby, 2011; Sniderman, Brody, & Tetlock, 1991, chap. 5). In deciding whether recipients deserve welfare, individuals pay attention principally to the recipients' efforts in alleviating their own need (Gilens, 1999; Oorschot, 2000). If welfare recipients are seen as able to work, but preferring not to (i.e., they are “lazy”), they are perceived as undeserving and welfare is opposed. In contrast, if welfare recipients are seen as unlucky victims of external circumstances, they are perceived as deserving and welfare is supported. While strong evidence has been produced that establishes an empirical link between welfare opinions and judgments of recipients' effort,

extant research lacks empirically well-supported explanations for why and how these judgments so strongly color welfare opinions (cf. Oorschot, 2006; Petersen, 2012).

Existing research has focused on two general explanations of the role of deservingness judgments in public opinion about welfare. First, a few researchers have attempted culturally or institutionally specific explanations. Thus, Gilens (1999, p. 63) links the importance of deservingness judgments to the individualistic culture of Americans. In contrast, Rothstein argues that a focus on recipients' deservingness is fostered in institutional contexts with means-tested welfare programs (Rothstein, 1998). The particularistic nature of these explanations, however, renders them inconsistent with the available evidence about the transnational distribution of these phenomena. Analyses of cross-cultural data from the World Values Survey show that the perception that poverty is caused by laziness—i.e., a lack of motivation to put in effort—is a universal driver of opposition to government efforts to reduce poverty (see Appendix). Data is available for 49 countries from all parts of the world and in all but one country, the effect is in the expected direction and significant. For 39 of the countries, the effect size is above .2 and most often substantially so. A large number of these countries are not notably individualistic, nor do they have the kinds of means-tested welfare institutions pinpointed as responsible by Rothstein (1998). Perceptions of deservingness are also central in explaining differences between nations in support for welfare. That is, much of the cross-national variation in public support for welfare (and, indeed, in actual social spending) can be explained by cross-national differences in perceptions of welfare recipients as lazy (Alesina, Glaeser, & Sacerdote, 2001; Larsen, 2006). Based on this evidence, there is a *prima facie* case that perceptions of welfare recipients' motivation to work are a universal driver of personal and public support for welfare across different nations and different welfare systems.

The second approach to explaining the dependence of welfare opinion on the perceived effort of recipients has focused on individual-level explanations that link the judgments to higher-order reasoning structures such as ideology. Indeed, several studies have documented that people on the political right wing (i.e., conservatives) are more likely to attribute welfare recipients' need to laziness, while liberals are more likely to view recipients' need as the product of external circumstances (see Skitka & Tetlock, 1993; Skitka, Mullen, Griffin, Hutchinson, & Chamberlin, 2002). Based on such findings, researchers have argued that deservingness judgments are somewhat effortful cognitive processes undertaken to support preexisting ideological commitments (e.g., Skitka et al., 2002). While this proposal is highly plausible, several observations suggest that the preoccupation with the effort of needy individuals is grounded in psychological processes that preexist ideology. First, if people engage in deservingness judgments from some culturally specific ideology, then people who have different or opposing ideologies ought not to provide parallel judgments. Yet they do. In a recent study, Petersen et al. (2011) demonstrated that while egalitarians and nonegalitarians might disagree in the abstract about welfare recipient deservingness, ideological differences vanish when asked to judge the deservingness of specific welfare recipients. In achieving this effect, deservingness judgments were shown to operate in an automated fashion, picking up cues and informing welfare opinions effortlessly (Petersen et al., 2011). Moreover, research in psychology on deservingness judgments show that individuals across cultures spontaneously judge the motivations of needy individuals in all kinds of everyday interactions—from lending exam notes to fellow students to helping a drunken person in the subway (Weiner, 1995). The importance of deservingness judgments, then, is not confined to issues (such as welfare) drawn from the domain of political ideology (see also Petersen, 2012). Such results cast doubt on claims that such judgments are solely the products of culturally learned ideologies. Indeed, they raise the question of whether elements of an underlying human universal psychology might be participating as well.

We propose that an approach that draws on recent findings in evolutionary psychology and hunter-gatherer studies can help explain why people spontaneously connect support for welfare to welfare recipients' effort. Accumulating evidence from evolutionary psychology and neuroscience indicates that human nature—our universal, reliably developing psychological architecture—includes an array of evolved cognitive and emotion programs tailored by natural selection to solve recurrent adaptive problems faced by our group-living ancestors (Sell, Tooby, & Cosmides, 2009; Tooby & Cosmides, 2008; Tooby, Cosmides, Sell, Lieberman, & Sznycer, 2008). Here we explore the implications of (1) the hypothesis that the social emotions of anger and compassion were designed by natural selection, in part, to regulate whether and to what extent we want to help a needy person, and (2) the hypothesis that these emotion programs are embedded in a system of cognitive mechanisms that collectively implement a *logic of social exchange* that evolved to advantageously manage mutual assistance among our ancestors in small-scale foraging groups. From this theoretical framework, we argue that the pervasive effect of perceptions of welfare recipients' effort regarding work on support for welfare arises because these perceptions fit the input systems (i.e., resemble the triggers) that the two social emotion programs, anger and compassion, are designed to monitor and respond to.

Below, we flesh out this argument and then report a series of four studies conducted to test predictions drawn from this theory. In Study 1, we demonstrate that welfare opinions are in fact powerfully shaped by social emotions. When activated, these emotion programs influence not only welfare opinions but also the ease with which they are formed. In Study 2, we provide evidence that anger and compassion mediate the link between effort cues and attitudes about welfare and that they do so independently of the ideology of the observers. In Study 3 we show that the fit between anger and compassion on the one hand and perceptions of welfare recipients' effort on the other are highly specific. That is: (1) it is specifically perceptions about welfare recipients' effort rather than other types of perceptions that regulate anger and compassion; and (2) perceptions of welfare recipients' effort regulate the activation of anger and compassion rather than emotions such as anxiety, contempt, and disgust. Study 4 demonstrates that this fit between effort perceptions and anger and compassion is robust across two highly different countries and welfare systems: the United States and Denmark.

Our aim is to provide evidence for the hypotheses that anger and compassion constitute a core set of *mechanisms* through which perceptions and cues of welfare recipients' efforts translate into opinions on social welfare; and, second, that these mechanisms operate in similar ways for individuals across ideologies and countries. In that regard, our aim in this article diverge from traditional goals such as predicting individual differences in welfare opinions or explaining why some people believe that welfare recipients are lazy and others believe they are unlucky. Rather, we seek to elucidate the shared psychological mechanisms that are responsible for mediating between the two. Such an analysis presupposes rather than undermines the importance of other kinds of analyses. In understanding whether a specific individual perceives welfare recipients as lazy or not, one needs to rely on analyses of, for example, the content of the individuals' ideology (Skitka & Tetlock, 1993), the agenda of the media (Gilens, 1999), the structure of political institutions (Larsen, 2006), and the level of ethnic diversity in the individual's country (Alesina et al., 2001). Our contribution here is to illuminate the psychological mechanisms that process such individual and contextual factors and cause them to influence welfare opinions. We return to this theme in the discussion.

## Evolved Social Emotions and Public Opinion

Research in evolutionary psychology suggests that emotions are not vague and crude feelings and urges as intuition suggests (Tooby & Cosmides, 2008). Rather, our emotions constitute an array of distinct and sophisticated information-processing mechanisms, each designed by natural selection to solve specific problems facing our ancestors (Petersen, 2010; Sell et al., 2009; Tooby et al., 2008).<sup>1</sup> For millions of years, our ancestors lived in small-scale groups (Alford & Hibbing, 2004; Cosmides & Tooby, 2006; de Waal, 1989), and some emotions—the social emotions—have design features that evolved for successfully solving recurrent adaptive problems of group living—such as sharing, exploitation, coalitions, power relations, hierarchy, collective action, punishing norm violators and managing intergroup relations (Petersen, 2009).

The social emotion of compassion, for instance, seems to be designed for motivating investing in social partners in need (Goetz, Keltner, & Simon-Thomas, 2010; Petersen, Sell, Tooby, & Cosmides, 2010). The evolved function of another social emotion, anger, is to defend against exploitation and bargain for better treatment. It is triggered when other people place too low value on one's welfare (Sell et al., 2009). In this way, anger is also distinguished from the two otherwise related emotions of contempt and disgust (Ekman, 2004; Rozin, Lowery, Imada, & Haidt, 1999). Anger is designed to increase the social investments of the target of anger, and hence it motivates approach (Petersen et al., 2010; Tooby et al., 2008). In contrast, contempt and disgust motivate avoidance. For example, the same neural circuits are activated in moral disgust as in disgust for contaminating matter (e.g., blood, excrement) and, in parallel, both kinds of disgust motivate avoidance of further contact with its target (Rozin, Haidt, & McCauley, 2000). In contrast to both anger and disgust, contempt operates primarily in the domain of status, and the elicitation of contempt functions to communicate that the target is of lower status and to facilitate avoidance across levels of social hierarchies (Rozin et al., 1999). Hence, while anger, contempt, and disgust are all important to social interaction and facilitate treating the object in a negative manner, each serves independent evolved functions and hence motivates different acts and trade-offs.

The existence of multiple, qualitatively distinct social emotion programs carry major implications for political science research. We suggest that many modern political issues, such as welfare, tax payments, criminal sanctions, redistribution, revolution, immigration, and race relations contain basic dilemmas that our ancestors evolved to deal with in order to successfully navigate social relationships (Alford & Hibbing, 2004; Cosmides & Tooby, 2006; Petersen, 2009, 2012). By implication, the mind of modern citizens is endowed with a toolbox of specialized mechanisms, including the social emotions, that could assist and facilitate their political decision making. Yet, these cognitive and emotion programs were designed in ancestral environments to respond to cues that were predictive in those environments. Consequently, they should be activated or inactivated when exposed to cues that mimic these ancestral cues—whether or not these cues are rationally relevant in evolutionary novel situations such as modern mass politics. It is within this general framework we seek to elucidate the underpinnings of deservingness judgments in welfare opinions.

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<sup>1</sup>In understanding the structure of the human mind and its constituent mechanisms, ancestral conditions are emphasized because the majority of our species only gave up forager life a few thousand years ago (Rindos, 1987). This is too little time for selection to engineer complex species-typical adaptations to novel postforager conditions (instead, one observes geographically limited responses to intense selection pressures such as local diseases like malaria or foods like milk, involving small numbers of alleles, or small randomly dispersed genetic differences at the individual level; see Tooby & Cosmides, 1990). Hence, whatever species-typical psychological mechanisms exist evolved in response to life in the preagricultural environment.

## Ancestral Subsistence, Natural Selection, and the Logic of Social Exchange

Modern welfare institutions entail redistribution, i.e., the transferral of wealth from the most to the least well-off. In this sense, modern welfare states are large-scale social exchange systems. Yet social exchange is far from a recent Western cultural invention. Anthropological studies of living foragers have uncovered complex and pervasive systems of sharing both within and between families (Kaplan & Gurven, 2005). Taken together, hunter-gatherer studies, paleoanthropological evidence, and primatological evidence support the view that our ancestors have been engaging in social exchange for hundreds of thousands or millions of years (Cosmides & Tooby, 1992).

### Social Exchange in the Context of Foraging

Our adaptations for social exchange evolved to operate in a world of small foraging groups. Importantly, the foraging niche that ancestral humans occupied involved the exploitation of large game, a high-quality, nutrient-dense, large-packaged food resource (Kaplan, Hill, Lancaster, & Hurtado, 2000). Such resources are difficult to acquire, and, hence, hunter-gatherers regularly experienced high variance in hunting success due to chance, illness, or other adversity (Hill & Hawkes, 1983; O'Connell, Hawkes, & Jones, 1991; Sugiyama, 2004). Such interruptions in the flow of calories posed an acute adaptive problem for our ancestors (Kaplan et al., 2000). At the same time, hunting successes would often provide more nutrients than a single individual or his family could consume at one time. While the capacity to store excess food was sharply limited, this enabled storage in the form of sharing and through the imposition of reciprocal sharing obligations from those one had shared with (Cosmides & Tooby, 1992; Lee & DeVore, 1968).

Formal modeling indicates that such forms of  $n$ -person social exchange can be an adaptive solution to the resource variance problem and buffer risk among foragers (Axelrod & Hamilton, 1981; Cosmides & Tooby, 1992, 2006; Kameda, Takezawa, Tindale, & Smith, 2002; Kaplan, Hill, & Hurtado, 1990). Consistent with this, a number of studies have shown that human foragers (and, perhaps, nonhuman primates) share a resource to a greater extent if the acquisition of the resource is subject to random variance (Cashdan, 1980; de Waal, 1996; Kaplan & Hill, 1985). Ancestrally, sharing in situations of resource variance produced average net gains to participants because resources were shifted from those with small marginal returns on additional resources (because they had more) to those with greater marginal returns (because they had less). Even for those who have more at any one time, such redistributive strategies would be adaptive if reversals of condition occur with sufficient frequency, and if an exchange is indeed reciprocal, i.e., if over the long run those who receive also give (Cosmides & Tooby, 1992; Trivers, 1971).

### Cheaters as an Adaptive Problem

One significant challenge, in the latter respect, is that practicing sharing exposes sharers to opportunistic exploitation by those that reap the benefits of others' productive efforts without incurring the costs of contributing (here called *cheaters*) (Cosmides & Tooby, 1992; Price, Cosmides, & Tooby, 2002). This increases the fitness of the cheater but diminishes the adaptive value of social exchange and, hence, gives rise to a selective counterpressure for the evolution of mechanisms for detecting cheaters, redirection of assistance away from cheaters, and responses designed to recalibrate the motivations of cheaters. Thus, social exchange entails an evolutionary arms race between cooperators and cheaters.

This entails the prediction that the human mind is well-adapted to detecting and reaction against cheaters. And as predicted, 30 years of experiments have shown that the human mind includes reasoning specializations for detecting cheaters in social exchanges, i.e., for

solving tasks involving the identification of individuals who takes benefits without paying the required costs (Cosmides & Tooby, 2005). In support of the view that these specializations are adaptations, researchers have demonstrated their existence cross-culturally, including in small-scale societies (Sugiyama, Tooby, & Cosmides, 2002); that performance appears just as good in culturally unfamiliar as culturally familiar contexts (Cosmides & Tooby, 2005); that capacities for cheater detection is found in very young children (Harris, Nunez, & Brett, 2001); and that such capacities have distinct neural underpinnings (Stone, Cosmides, Tooby, Kroll, & Knight, 2002). Importantly, the detection of cheaters also has the predicted behavioral effects. Hence, evidence from experimental economic games shows that people cease to contribute to a public good if others don't follow suit (see, e.g., Fehr & Gächter, 2000). Similarly, observational studies of foragers (Kaplan & Gurven, 2005; Kaplan & Hill, 1985) indicate that food sharing among nonkin is to a significant degree reciprocal, i.e., conditional in the sense that A shares with B, if B shares with A.

In discriminating between cheaters and noncheaters, evolutionary analysis suggests that our minds have been designed to especially attend to cues of others' motivation to take part in the system of social exchange, i.e., their willingness to accrue and exchange resources (Cosmides, Barrett, & Tooby, 2010; Delton, Cosmides, Guemo, Robertson, & Tooby, 2012). Such cues include, for example, the efforts spent when accruing resources or the gratitude expressed when receiving benefits. The obvious alternative cue, actual foraging success, is inferior for two reasons. First, the random variation in foraging success makes it difficult to gauge whether others' lack of hunting success stems from low effort or bad luck. Second, studies of living foragers show that individuals differ in their foraging competence (Kaplan & Gurven, 2005), and, hence, some have consistently less success than others without this necessarily being the results of parasitic motivations. A number of studies document that high food producers obtain, for example, more mating opportunities and greater offspring survivorship and hence seem to be repaid in other currencies than food (Kaplan & Gurven, 2005). Hence, from the perspective of a high producer, it can pay off to share with low producers but, again, this is only the case if the latter are motivated to put in effort and reciprocate (e.g., in other currencies).

In line with these arguments, experimental studies show that humans represent bad outcomes with different mental categories depending on whether those outcomes are attributable to incompetence or lack of motivation (Delton et al., 2012). Similarly, a range of studies in neuroscience have provided evidence for the important role of intentions in cheater detection (for an overview of this research, see Petersen, Roepstorff, & Serritzlew, 2009). For example, fMRI studies have demonstrated that cheater-detection tasks engage distinct theory-of-mind-related neural circuits (i.e., circuits involved in gauging the intentions of others), which are not engaged by other logically equivalent tasks (see Ermer, Guerin, Cosmides, Tooby, & Miller, 2006).

### **The Evolved Function of Anger and Compassion in the Context of Social Exchange**

Given the selection pressures acting on social exchange, we suggest that the two social emotions, compassion and anger, are centrally involved in carrying out the motivational agenda mandated by the strategy of sharing. Conditional sharing is a social investment strategy, and—as described above—compassion and anger regulate social investments. Specifically, the need for insurance against gaps in the flow of calories (e.g., in situations of illness) made it important to cultivate and invest in potentially valuable social relationships (Tooby & Cosmides, 1996). In the face of needy noncheaters (individuals who are able and willing to reciprocate on future occasions), sharing is the adaptive response. Given the motivational functions of compassion, we expect compassion to facilitate this response towards noncheaters. In the face of cheaters (individuals with parasitic motivations),

however, the adaptive response entails avoiding sharing but also attempts to recalibrate the cheater's motivational system to be more cooperative. The latter is important. In ancestral small-scale groups, there would be only a limited number of potential valuable social relationships, and hence it would be important not just to dismiss strategic cheaters but to recalibrate them so that they become better cooperators. This strongly suggests that the detection of cheaters in a sharing situation should trigger anger—the emotion designed to defend against exploitation and incentivize the up-regulation of investments by others (e.g., Sell et al., 2009)—rather than the more avoidance-oriented emotions of contempt and disgust. Only in severe cases should individuals feel compelled to shun the target altogether. Consistent with this, a number of anthropological accounts report that, while individuals who do not share sometimes are ostracized, they are allowed reentry in the community if their sharing levels increase (Kaplan & Gurven, 2005). More generally, cross-cultural studies of everyday morality show that anger and compassion are in fact regulated by effort-related perceptions in the face of needy individuals. Hence, Weiner (1995) reports studies from the United States, Canada, and Japan that consistently show that subjects respond with high levels of anger and low levels of compassion to a lack of effort among individuals requesting help.

### **Predictions: Emotions and Welfare Recipients as Potential Cheaters**

Citizens' responses to the political issue of welfare, we argue, are at least partly shaped by this inherited psychology. To the evolved mind, assistance provided to welfare recipients is a cue of possible exploitation by unproductive others. On this theory, welfare judgments should automatically recruit the relevant psychological machinery and arrive at a decision about whether helping is legitimate, based on the perceived cooperative intentions of welfare recipients—as if individuals were in fact personally engaged with welfare recipients (Petersen, 2012). As demonstrated by the literature on deservingness judgments and welfare opinions and our own initial analysis (see Appendix), this is in fact what happens in country after country. An evolutionary framework provides a natural explanation for why perceptions of laziness regulate judgments about whether recipients deserve welfare. More importantly, the evolutionary framework allows us to move beyond current knowledge by elucidating the precise role that social emotions such as anger and compassion play in this psychology. From this theory, as described in detail below, we derive 14 predictions. The predictions are listed in Table 1.

If welfare issues are processed by emotion programs that evolved to regulate social interactions, welfare opinions should be influenced more strongly by social emotions than by other less relevant kinds of emotions. Specifically, we expect feelings of compassion towards welfare recipients to increase support for welfare and redistribution (Prediction 1), and feelings of anger, contempt, and disgust to decrease such support (Prediction 2). In contrast, prior research on emotions in political science has, in general, focused on nonsocial emotions such as anxiety (see Marcus, Neuman, & MacKuen, 2000; Neuman, Marcus, Crigler, & MacKuen, 2007; Redlawsk, 2006). Current evidence suggests that anxiety evolved as a precautionary program to motivate vigilance and preparation toward hazards of diverse kinds (Fiddick, 2004; Petersen, 2010) and, hence, is less relevant to social welfare if processed by our evolved logic of social exchanges. To corroborate this argument, we contrast the effects of the social emotions with the effect of anxiety that we predict to be small in the context of welfare opinions (Prediction 3).

Converging results from several areas of research suggests that evolved dedicated circuits tend to operate more rapidly and effortlessly within their natural domain than do acquired skills or dedicated circuits used outside their domain (Ermer et al., 2006; New, Cosmides, & Tooby, 2007). For this reason, we expect social emotions will influence welfare opinions in

ways that are distinct from other emotions and opinion factors. For example, if generating support for or opposition to assistance is an evolved function of these emotions, then the activation of these emotions is predicted to facilitate such judgments—that is, activation should make welfare judgments fast and intuitive. Specifically, we expect that citizens feeling aversion (anger, contempt, or disgust) to or compassion for welfare recipients should respond faster when asked for their welfare opinions (Predictions 4 and 5). In contrast, neither the precautionary emotion of anxiety (see also Marcus et al., 2000; Prediction 6) nor traditional factors of opinion such as ideology (Prediction 7) should facilitate opinion formation in this fashion.

Predictions 8 and 9 test our core argument: that anger and compassion towards welfare recipients are triggered by cues of the absence or presence of effort in alleviating their own or others' need. Hence, we expect welfare recipients characterized as lacking work motivation to elicit anger, and welfare recipients with such motivation to elicit compassion. Indeed, the activation of compassion and anger should mediate effects of these cues on support for welfare (Predictions 10 and 11). Furthermore, we expect compassion and anger to mediate effort cues independently of political ideology (Prediction 12). As noted in the introduction, Skitka, Tetlock, and colleagues showed that political ideology has an impact on welfare opinions (Skitka & Tetlock, 1993; Skitka et al., 2002). Yet, if it is the logic of social exchange, built into the structure of the anger and compassion systems, that makes modern citizens sensitive to effort cues, we should expect their operations to be independent of the effects of political ideology. Conservatives and liberals are expected to share the same species-typical mental architecture and, hence, should be angered or feel compassionate by exposure to the same ancestrally relevant cues. That is, while conservatives and liberals disagree in the abstract about welfare recipients, these general differences should drop in importance when individuals across the political spectrum are provided with the same cues, as long as these cues fit the input conditions of the emotional programs (for a more extended discussion, see Petersen, 2009).

As discussed, previous studies—most notably, Weiner (1995) and Feather (2006)—have predicted and found relationships between effort-related perceptions and feelings towards the needy in personal everyday situations of help-giving. In that perspective, a main empirical contribution of the present study is to show that modern individuals also enter and process the evolutionarily novel phenomena of impersonal mass politics as if it were, in fact, a personal exchange of help, using the same set of highly structured cognitive and emotional systems. Moreover, the adaptationist approach allows us to provide even more specific hypotheses on the relationship between effort perceptions and emotions than those offered by Weiner (1995) and Feather (2006).

First, the argument that emotional sensitivity to effort cues reflects adaptive strategies designed to facilitate investments in reciprocal social exchanges allowed us to pinpoint anger as the distinctive aversive emotion triggered in the face of lack-of-effort individuals requesting help. Feather (2006, p. 46) argues that lack of effort triggers feelings of resentment. This includes anger but could also include other negative emotions such as contempt. Similarly, while Weiner (1995) does focus more specifically on anger, he does not differentiate clearly between anger and other aversive emotions (e.g., he occasionally substitutes disgust for anger in his analyses and never compares the effects of such distinct emotions; see p. 156). Here, we predict that the sensitivity to effort cues is specific to anger and compassion, compared to other negative emotions such as anxiety and even more anger-related emotions such as contempt and disgust (Prediction 13).

Second, both Feather (1999, p. 41) and, in particular, Weiner (1995) focus on the controllability of the need as a main factor in the regulation of anger and compassion



towards the needy. Specifically, lack of effort (a controllable cause of need) and lack of ability (an uncontrollable cause of need) are juxtaposed as key elicitors of anger and compassion, respectively. The evolutionary perspective, however, leads to different predictions. If we are designed to direct social investments towards needy individuals who will reciprocate on future occasions, uncontrollable but chronic low levels of ability in the form of incompetence should, if anything, *decrease* our willingness to help.<sup>2</sup> At the same time, however, such a decrease should not be directly mediated by anger or compassion. Hence, if the role of anger and compassion in the face of requests for help is, on the one hand to recalibrate the motivations of strategic cheaters and, on the other hand to direct investments towards cooperatively motivated noncheaters then the competence of the individual should be irrelevant for their execution as argued in the discussion on the role of actual foraging success in cheater detection. Where a focus on controllability leads to the expectation that people feel compassionate towards an incompetent individual in need, we, in other words, predict that anger and compassion toward welfare recipients are specifically regulated by perceptions of their cooperative intentions (as reflected in their efforts to find work) rather than by perceptions of their competence (Prediction 14). As we will demonstrate, the more avoidance-oriented social emotions do, however, pick up cues about competence.

## Overview of Studies

We test our predictions in four studies. Studies 1–3 were conducted in Denmark and Study 4 was conducted in the United States. Both the United States and Denmark are wealthy developed democracies but, at the same time, they differ on a number of important dimensions. The United States is a large ethnic and racially heterogeneous country with a small welfare state based on means testing and a highly individualistic culture. In contrast, Denmark is a small homogenous country with a comparatively large welfare state where welfare benefits are universally provided rather than granted on the basis of means testing. In this way, a comparison of the influence of social emotions on social welfare opinions among Danes and Americans gives us important information about the universality of the underlying mechanisms across important cultural differences.

Study 1 is designed to test the predictions regarding the general importance of social emotions to welfare opinions (Predictions 1–7). Study 2 is an experimental study designed to test Predictions 8–12 and, hence, establish the validity of the core argument that our focal emotions, anger and compassion, mediate the opinion effect of effort and motivation cues. Predictions 13 and 14 test the functional specificity of the relationship between anger and compassion, respectively, and perceptions of work motivation. The validation of these final predictions is important for establishing the evolutionary informed proposal that each emotion represents a functionally distinct and well-designed information-processing system. Due to their importance, we seek to establish that they are cross-culturally valid. Hence, Study 3 is based on a Danish sample, and Study 4 is based on a U.S. sample, but otherwise the two studies use exactly the same measures to test Predictions 13 and 14.

## Study 1

### Design and Measures

Among a sample of Danish citizens, a survey on welfare opinions was collected over the internet in the fall of 2008. The sample consisted of Danes aged between 18 and 70 and is based on a representative quota sample designed to achieve national representativeness on

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<sup>2</sup>On the contrary, from an adaptationist perspective, temporary losses of ability, e.g., incapacity due to illness, should increase the motivation to help, as it indicates that the need was not the product of laziness—that is, not due to a lack of effort.

sex, age, and geographical location. The number of final subjects was 1,537, and the response rate was 34%.

To test Predictions 1–3, i.e., whether social emotions influence welfare opinions, subjects were presented with a battery of six Likert-scaled items about redistribution, welfare, and the role of the state. Subjects were asked to indicate disagreement with the following statements on a 7-point scale ranging from “Completely Agree” (0) to “Completely Disagree” (6): “High incomes should be taxed more than is currently the case” (reverse coded), “We should resist the demands for higher welfare benefits from people with low incomes,” “The wealthy should give more money to those who are worst off” (reverse coded), “The government spends too much money on the unemployed,” “The state has too little control over the business world” (reverse coded), and “In politics, one should strive to assure the same economic conditions for everyone, regardless of education and employment” (reverse coded). The answers to these items were added together to form a scale of support for the welfare state ranging from 0 to 1 ( $\alpha = .78$ ).

Together with the subjects’ responses to the welfare items, response times for the item battery as a whole were collected.<sup>3</sup> In psychology, response time is a standard measure of the degree of processing used to form a response and, hence, the collection of response times allows us to test Predictions 4–7, that is, whether the activation of social emotions makes opinion formation easier. However, using response times collected over the web (compared to the laboratory) entails some complications (see Petersen et al., 2011). Variability in travel time through the Internet introduces some noise into these measures, and, hence, measurements will be influenced by, for example, the speed of the subject’s Internet connection. To compensate, we therefore used ranked response times rather than the exact response time in milliseconds (i.e., the fastest response time was assigned a value of 1, the second-fastest was assigned a value of 2 and so forth). The ranking has been rescaled from 0 (fastest response time) to 1 (slowest response time).

To measure emotional reactions to welfare recipients, subjects’ were asked “How do you feel, when you hear or read about people on social welfare?” and presented with a list with seven emotions: anger, disgust, contempt, compassion, sympathy, anxiety, and fear. Subjects were asked to answer on a 7-point scale with the endpoints labeled “Not at all” and “Very strongly.” Following Marcus, MacKuen, Wolak, and Keele (2006), three emotional scales were created. As we do not expect differences in their effects here, anger, disgust, and contempt were put together in a scale measuring the intensity of aversive social emotions ( $\alpha = 0.89$ ). Compassion and sympathy were put together in scale measuring the intensity of compassionate social emotions ( $\alpha = 0.82$ ). Finally, the two precautionary emotions, anxiety and fear, were put together in an anxiety scale ( $\alpha = 0.78$ ). All scales have been coded from 0 (low intensity) to 1 (high intensity).

As basic control variables, we measured the subjects’ sex, age, and education. Age is measured in years, while level of education has been coded from 0 to 1. Finally, as a measure of the general ideology of the subjects, we asked them to place themselves on an 11-point political left-right scale. This measure of ideology has also been scaled from 0 to 1.

## Results

Table 2 presents the tests of Predictions 1–3. Predictions 1 and 2 entail that aversive and compassionate social emotions strongly influence welfare opinions. In Model 1, welfare opinions are regressed on the three basic control variables (sex, age, and education) and the

<sup>3</sup>The whole battery was presented to subjects on a single screen during the web survey. The collected response times constitute the time lapse from when the subject enters this screen until the subject has completed all items and moves to the next screen.

three emotion scales. As predicted, we find strong and significant effects of the two scales of social emotional reactions to welfare recipients. With all variables scaled from 0 to 1, the coefficient of  $-.19$  in the case of aversive social emotions implies that a shift from no aversive feelings to strong aversive feelings decrease support for welfare by about one-fifth of the full scale. In the case of compassionate social emotions, the coefficient of  $.30$  implies that a shift from no compassionate feelings to strong compassionate feelings increases welfare support by about one-third of the full scale. As expected from Prediction 3, although the two social emotion scales strongly influence welfare opinions, the effect of the precautionary anxiety scale is not significant. This pattern of results provides strong support for the idea that when modern political problems resemble ancestral social problems—as is the case with the welfare issue—the activation of the relevant emotions provides considerable guidance when citizens form opinions. Model 2 includes the predictors of Model 1 plus the subjects' general ideology. Supporting the Skitka, Tetlock, and colleagues proposal, we also find that ideology is a powerful predictor of welfare opinions—indeed stronger than other factors (Skitka & Tetlock, 1993; Skitka et al., 2002). Nonetheless, the effects of both aversive and compassionate emotions remain significant after the inclusion of this classic explanatory factor.

While both social emotions and ideology predict welfare opinions, the evolutionary perspective suggest that they operate in different ways in the opinion-formation process. Social emotions are evolved psychological systems designed to facilitate social responses that would have been adaptive ancestrally. In contrast, the ideologies of left and right are relatively recent, culturally elaborated constructs whose complex specifics must be memorized. These two processes of opinion formation (triggering existing circuits versus reasoning from memorized data structures) are fundamentally different in kind. Thus, Predictions 4–7 entail that social emotions not only shape the content of subjects' welfare opinions but (unlike ideology) the more they are activated, the more rapidly they should organize welfare opinions. Thus, increasing intensity of emotional reactions to welfare recipients should be associated with lower response times when answering questions about welfare opinions. Ideology should not. To test this prediction, Model 3 in Table 2 regresses subjects' response times to welfare opinions on the different explanatory variables.

As predicted, we see significant negative effects of the two social emotions scales on response times. The more intensely subjects feel aversive or compassionate emotions towards welfare recipients, the faster they respond to questions about welfare. In contrast, there are no effects of either anxiety or ideology on response time. One could, for example, have argued that the welfare state has been the central political project of the left, and, therefore, those belonging to the ideological left should be able to answer questions about welfare rapidly. As revealed in the model, this is not the case. The relationship between ideology and response time can, however, also be modeled differently. Hence, as the welfare state has been a focal issue in the political conflict between the two political wings, one could argue that what should matter is the intensity of one's ideological commitment (i.e., rather than whether one belongs to the left or the right). This predicts a curvilinear relationship between ideology and response time such that subjects with higher absolute ideology scores (whether left or right) would answer welfare opinion question faster. In Model 4, we include a quadratic term to model a curvilinear effect. This term is insignificant.<sup>4</sup>

In sum, Study 1 demonstrates that opinions on welfare issues are associated with the intensity of social emotions but not of precautionary emotions (anxiety). Social emotions contribute to welfare opinion formation in two ways. First, social emotions pull welfare opinions in one or the other direction. Compassionate emotions towards welfare recipients increase support for welfare and redistribution, while aversive emotions decrease support.

Second, the activation level of social emotions, but not of precautionary emotions, is associated with faster response times in welfare opinions. Social emotion programs were engineered by selection to motivate or inhibit assistance, and regulating support for welfare is therefore a modern case of its evolved function. Anxiety was not ancestrally relevant to this task, and so has no effect on it. Hence, it seems likely that when evolved circuits are triggered by relevant inputs, they tend to carry out their functions rapidly. We conclude that when emotions produce the outputs for which they are designed, they function in ways that are quite different from how traditional opinion factors (such as ideology) operate. While ideology is a powerful predictor of welfare opinions, citizens do not make inferences from ideology with the same ease as they do from their moral feelings.

## Study 2

Study 2 tests whether perceptions of welfare recipients' cooperative intentions facilitate opinion formation because these perceptions fit input systems that anger and compassion evolved to monitor.

### Design and Measures

We designed an experiment in which subjects are presented with a series of sham welfare recipients who are characterized as varying in their effort to alleviate their unemployment. We then measured the subjects' opinions towards the recipient, as well as their feelings of anger and compassion.

Two hundred and seven Danish undergraduates in political science completed an experiment with three conditions. In each condition, the subjects were presented with a specific recipient of social welfare, but antecedent information was manipulated across conditions such that the recipients varied in whether their need was attributable either to bad luck or to laziness. In the control condition, subjects were asked to "Imagine a man who receives social welfare benefits." In the condition with the unlucky recipient, subjects were asked to "Imagine a man who receives social welfare benefits. He has always had a regular job, but has now been the victim of a work-related injury. He is very motivated to get back to work again." Finally, in the condition with the lazy recipient, subjects were asked to "Imagine a man who receives social welfare benefits. He has never had a regular job, but he is fit and healthy. He is not motivated to get a job."

To obtain an opinion measure, subjects were asked whether they agreed or disagreed with the following statement: "The activation requirements should be made stricter for him." In Denmark, recipients of social welfare have the right and obligation to take part in job activation programs such as job training. By focusing on whether these requirements should be made stricter, we are essentially asking whether the recipient should pay greater costs in return for his welfare benefits (see also Petersen et al., 2011).

To obtain measures of emotions, subjects were asked to agree or disagree with the two following statements: "I often feel anger towards people like him," and "I often feel compassion towards people like him."

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<sup>4</sup>Here, we focus on individuals' self-perceived ideological position. Another approach to assessing ideology entails measuring the extent to which individuals have a deep understanding of what their position entails (cf. Converse, 1964). Given that sophisticated ideologues could have automated parts of their opinion formation process on political issues (cf. Schreiber, 2007), it is possible that we would find effects on response time using such a measure. In the survey, this measure is not available nor is the traditional measure of political sophistication, political knowledge, available. The effects are, however, controlled for education—an often-used proxy for sophistication (cf. Sniderman et al., 1991). The effect of education is negative (i.e., the more educated respond faster), but the effect is small and insignificant.

To obtain a measure of the subjects' political ideology, subjects were asked to agree or disagree on 5-point scales with three statements: "The state has too little control over private investments," "In politics, one should strive to provide all with the same economic conditions," and "High incomes should be taxed more heavily than is currently the case." The answers were added together to form a scale ( $\alpha = 0.76$ ) such that higher values indicates a more liberal (i.e., egalitarian) ideology.

All variables are scaled between 0 and 1 and all t-tests are one-sided as all performed t-tests relate to directional hypotheses.

## Results

Using OLS regression, we investigated whether the emotional measures mediate the relationship between cues to the effort of the recipient and opinions about welfare (see Table 3). In Model 1, we regress support for stricter activation requirements on the experimental conditions. As reference category, we use the control condition, and, hence, the model tests whether the lazy and the unlucky recipient, respectively, are treated differently from this neutral recipient. Consistent with previous studies, model 1 demonstrates that cues of effort affect opinions towards a recipient. Subjects are significantly more supportive of tightening the lazy recipient's requirements and significantly less supportive of tightening the unlucky recipient's requirements.

In Models 2–4, we test whether this effect is mediated by feelings of anger and compassion. In Models 2 and 3, we regress anger and compassion, respectively, on the experimental conditions. As predicted by Predictions 8 and 9, subjects feel more anger and less compassion towards the lazy recipient and less anger and more compassion towards the unlucky recipient. The important question, then, is whether these affective responses mediate the opinion effects of the experimental manipulations. In Model 4, we see that they do. Hence, when controlling for our two simple measures of emotions, we remove any direct effects of the "lazy recipient" manipulation on opinion. Hence, the effect changes from .20 and high significance in model 1 to .09 and insignificance upon inclusion of the emotion measures. This control also removes about one-third of the effect of the "unlucky recipient" manipulation (i.e., the effect changes from  $-.22$  to  $-.16$ ). Formal tests (Sobel tests) of mediation corroborate these conclusions. Hence, anger significantly mediates the opinion effect of the "lazy recipient" manipulation ( $z = 3.557$ ;  $p < .001$ ) and the "unlucky recipient manipulation" ( $z = 2.309$ ;  $p = .01$ ). Similarly, compassion significantly mediates the opinion effects of the "lazy recipient" manipulation ( $z = 1.889$ ;  $p = .03$ ) and the "unlucky recipient" manipulation ( $z = 1.743$ ;  $p = .04$ ). These findings support Predictions 10 and 11.

If these effects indeed are rooted in the emotions of anger and compassion, then we should expect the emotional reactions of individuals to be sensitive to the experimental manipulations regardless of the individuals' ideological views (Prediction 12). Whether this is the case is tested in Models 5–7. Here, the political ideology of the subjects together with two-way interactions between political ideology and the experimental manipulations are regressed on support for stricter requirements and the feelings of anger and compassion. Hence, these models test whether individuals across the political spectrum react any differently to the three manipulations. Model 5 reveals that while ideology has a large effect in the control condition (cf. the main term for ideology), this effect is substantially and significantly reduced in the two experimental conditions where subjects are presented with specific and ecologically valid effort cues (cf. the coefficients and signs of the interaction terms). In fact, further analyses show that the effect of ideology is insignificant in the two treatment groups (lazy recipient:  $r = -.18$ ,  $p = .14$ ; unlucky recipient:  $r = .06$ ,  $p = .64$ ).

Models 6 and 7 suggest that a reason why ideology does not condition opinions in the face of specific cues is that anger and compassion are activated in similar ways in subjects across the ideological spectrum. Hence, in both models, we see that the interaction terms are insignificant. This indicates that for subjects across the political spectrum, the differences in felt anger and compassion towards the lazy and unlucky recipients, on the one hand, and the control condition, on the other hand, are just the same. These findings, in other words, support Prediction 12.

In sum, this study demonstrates, first, that the opinion effects of cues about welfare recipients' effort are (at least partly) mediated by feelings of anger and compassion. This is consistent with Weiner's (1995) studies in psychology showing that similar cues feed into anger and compassion in ordinary social interaction. Here, we show that this relationship holds also in the domain of social welfare. As expected, when the cues surrounding mass politics fit the input conditions of the emotion programs that guide our everyday behavior, these emotions start providing guidance in political-opinion formation. Even in impersonal situations such as mass politics, our evolved emotions are engaged whenever ancestrally relevant cues are present. Second, we have demonstrated that the causal effect of these cues on emotions exists irrespective of individual-level differences in political ideology. In this regard, it should be noted that the sample was based on political science undergraduates. Such a sample should be particularly prone to being affected by their ideological commitments, if there were effects to be found. Given this, these findings strongly suggest that citizens' preoccupation with whether welfare recipients are lazy or not do not emerge from ideological concerns but from the evolved structure of our emotional systems.

### Studies 3 and 4

In our two final studies, Studies 3 and 4, we demonstrate that the link between anger and compassion and perceptions of welfare recipients' motivation to work are specific in two senses. First, we demonstrate that perceptions of welfare recipients' laziness elicit anger rather than anxiety, contempt, and disgust (Prediction 13). Second, we demonstrate that feelings of anger and compassion are regulated by perceptions of welfare recipients' work motivation rather than competence (Prediction 14). Although earlier studies linked deservingness judgments and emotions, this result supports our proposal about the specific role of anger and compassion in the process of opinion formation. Furthermore, the claim that a mechanism or set of mechanisms are adaptations (typically) requires evidence of universality. Studies 3 and 4 are designed to test Predictions 13 and 14 cross-culturally. Using the same exact measures, Study 3 is based on a Danish sample, while Study 4 is based on a U.S. sample.

### Design and Measures

The data for Study 3 were collected as part of the survey used in Study 1. Hence, the basis for Study 3 is an approximately representative nationally representative sample of Danes ( $n = 1,537$ ). In Study 4, a survey was conducted among 274 undergraduates from a U.S. university in the spring of 2009.

To test predictions 13 and 14, we need measures of subjects' perceptions of welfare recipients' effort and competence and measures of subjects' emotional reactions to welfare recipients. To measure perceptions, we adapted standard measures of stereotypical beliefs from the American National Election Studies. Perceptions of welfare recipients' effort were measured using the following question: "Now we have some questions about how you perceive people on social welfare. In your opinion, are most people on welfare making an effort or are they lazy?" Subjects were asked to provide their opinion on a 7-point scale with the end points labeled "Making an effort" (0) and "Lazy" (6). Similarly, perceptions of

welfare recipients' competence were measured by asking: "In your opinion, are most people on welfare intelligent or unintelligent?" A 7-point scale was used with end points labeled "Intelligent" (0) and "Unintelligent" (6). This focus on intelligence as a measure of chronic levels of ability is in line with Weiner's (1995, p. 31) operationalization. Both measures were reversed such that high scores indicate that welfare recipients are perceived as high in effort and high in competence, respectively.

To measure emotions, we provided subjects with a list of emotions and asked "How do you feel when you hear or read about people on social welfare?" Here we focus on anger, compassion, anxiety, disgust, and contempt. As we predict that different emotions will be regulated by different perceptions, we assess each emotion separately, in contrast to study 1. Subjects answered on 7-point scales with endpoints labeled "Not at all" and "Very strongly."

## Results

We begin by contrasting anger and compassion with anxiety, until now the focal emotion in much of political science research. If the theoretical argument is valid, perceptions of welfare recipients' effort should regulate feelings of anger and compassion towards welfare recipients, but not anxiety. Figure 1 (Panels A and B) displays these relationships for the Danish and U.S. samples. The similarities between these two countries are striking. In both samples the zero-order correlations between anger and compassion on the one hand, and perceptions of effort on the other hand, are large and highly significant. Those correlations remain high when one statistically removes the effect of perceptions of welfare recipients' competence. In both Denmark and the United States, the perception that welfare recipients are lazy activates anger, while the perception that they are motivated to alleviate their own need activates compassion. In neither Denmark nor the United States is anxiety strongly associated with perceptions of effort. While anger and anxiety are similarly valenced, the effect of perceptions of effort is specific to anger. Hence, initial support is provided for Predictions 13 and 14.

With regard to Prediction 14, however, the important question is whether it is specifically perceptions of effort and motivation that feed into anger and compassion, or would any type of negative or positive perception have the same impact? In particular, our arguments focus on perceptions of the competence of welfare recipients. Other researchers have argued that uncontrollable causes of need—such as chronic low levels of ability in the form of incompetence—trigger compassion. Yet, evolutionary analysis and anthropological evidence suggest that when tagging an individual as a cheater or a noncheater, his competence is a less predictive cue than his effort. Therefore, if the role of anger and compassion in welfare opinions are underwritten by an evolved psychology for social risk buffering, we should *not* expect perceptions of competence to regulate feelings of anger and compassion.

Figure 1 (Panels C and D) displays these relationships for the Danish and U.S. samples. In both samples we find significant but moderate zero-order correlations: The perceptions of competence are positively correlated with compassion and negatively correlated with anger. If anything—and in contrast to predictions from a controllability perspective—incompetence reduces people's willingness to help. Importantly, however, in our data sets the perceptions of effort and competence are highly intercorrelated (Danish sample:  $r = .51$ ,  $p = .000$ ; U.S. sample:  $r = .42$ ,  $p = .000$ ). When we statistically remove the effect of perceptions of welfare recipients' effort, these correlations are greatly reduced, and all but one become insignificant (the remaining significant correlation is between compassion and perceptions of competence in the Danish sample, where the coefficient of .05 just stays significant due to the large sample size). Further statistical tests corroborate these findings. In both samples, the effect of perceptions of effort is significantly stronger than the effect of perceptions of competence

on both anger (Study 3:  $F = 60.68, p = .000$ ; Study 4:  $F = 11.13, p = .000$ ) and compassion (Study 3:  $F = 27.45, p = .000$ ; Study 4:  $F = 9.31, p = .002$ ). In neither sample do we find any significant correlation between feelings of anxiety and perceptions of competence.

These findings provide strong support for Prediction 14. Across the two samples, anger is specifically activated by needy individuals who are not motivated to put in effort and reciprocate, while compassion is specifically activated by needy individuals with cooperative motivations. It is, in other words, not any kind of negative or positive perception that regulates these emotions, nor is it directly a matter of controllability.

As shown above, perceiving welfare recipients as lazy does not trigger anxiety. While much prior research in political science has focused on the valence of emotions, this finding corroborates other studies showing that emotions need to be distinguished beyond valence (see Petersen, 2010). The question, however, is how far this process of distinction and characterization needs to go? Recent studies in political science have, for example, distinguished between aversive emotions (such as anger, contempt, and disgust) on the one hand and anxiety on the other hand (Marcus et al., 2006). However, if distinct emotions evolved to solve distinct adaptive problems, even closely related emotions such as anger, contempt, and disgust are expected to show sharply differentiated activation patterns and outputs in response to different classes of events.

Given the large potential gains of cooperation and the limited number of available social partners in the ancestral social environment of humans, evolutionary analysis suggests a sequence of countermeasures that humans should follow when confronted with someone who is exploitive. The first response vis-à-vis cheaters would have been to attempt to recalibrate their cooperative dispositions upwards (Sell et al., 2009). If that failed, withdrawal from cooperative arrangements and shunning would ensue. Recalibration of cooperative dispositions (e.g., effort) is the domain of anger rather than the avoidance-motivating emotions of disgust and contempt (Rozin et al., 1999; Sell et al., 2009). Thus, Prediction 13 entails that effort perceptions are specifically linked to the mobilization of anger.

Figure 2 compares the correlations between anger, disgust, contempt, and compassion towards welfare recipients on the one hand and perceptions of welfare recipients' effort on the other. As can be seen, the zero-order correlations between effort perceptions and contempt and disgust are highly significant and are about as large as the correlations between these perceptions and anger and compassion. However, feelings of anger, disgust, and contempt are highly intercorrelated in both the Danish (average  $r = .73$ ) and the U.S. sample (average  $r = .52$ ). The gray bars in Figure 2 show what happens when one statistically removes the effects of the other emotions and of competence perceptions: Although its magnitude decreases, the correlation between perceptions of effort and anger (controlling for contempt, disgust etc.), remains high and significant in both the Danish and the U.S. samples. In the case of contempt and disgust, in contrast, most of the effects disappear after controlling for the other emotions. Only the correlation between perceptions of effort and disgust in the Danish sample remains significant, but its effect is weak (partial  $r = -.08$ ). Statistical tests corroborate these conclusions. In both samples the correlation between anger and perceptions of effort is significantly stronger than the correlations between these perceptions and contempt (Study 3:  $F = 10.60, p = .001$ ; Study 4:  $F = 3.90, p = .05$ ) and disgust (Study 3:  $F = 5.27, p = .02$ ; Study 4:  $F = 4.15, p = .04$ ), respectively. The effect of compassion is, generally speaking, unaffected by control for the other emotions.

These findings support Prediction 13. As expected, there are cross-culturally robust links between perceiving a needy individual as lazy and experiencing anger towards this



individual, as well as between perceiving a needy individual as unlucky and experiencing compassion towards this individual. Perceptions of effort do not mobilize disgust and contempt directly, although these emotions can be co-activated with anger. A lack of cooperative effort in the target might just be one in a series of cues that need to be present before disgust and contempt are triggered and the target is shunned altogether. In fact, further analyses show that, across the two samples, there is a consistent two-way interaction effect between perceptions of effort and perceptions of competence on the avoidance-oriented emotion of contempt (Study 3:  $F = 8.23$ ,  $p = .004$ ; Study 4:  $F = 5.86$ ,  $p = .02$ ). Substantively, this significant interaction effect expresses that if welfare recipients are seen as lazy, contempt increases strongly with the perception that they also are incompetent. If, however, welfare recipients are seen as cooperatively motivated, competence judgment has no effect on contempt. Hence, when needy individuals are neither motivated to reciprocate help nor have valuable competences, they suffer a strong loss of social respect—presumably, because they are of low value as cooperative partners.

## Conclusions

Evolutionary psychologists and hunter-gatherer researchers have developed multiple, converging lines of evidence that support the view that social exchange functioned among our ancestors as a social insurance strategy through which individuals could guard against interruptions in the food supply due to injury or bad luck. By sharing with others, individuals invest in future help. By making that sharing conditional on whether potential recipients were disposed to contribute when they could, sharers protected themselves against exploitation. The recurrent payoffs to conditional cooperation—extending over hundreds of thousands of years—selected for psychological mechanisms in our species that reliably guided our ancestors to implement this winning strategy. On this view, the social emotions of anger and compassion evolved, in part, to motivate these investment decisions.

Our results accord with the view that modern citizens form political opinions using an array of emotion programs that evolved to process and solve ancestral social problems. Here we found that anger and compassion are causally implicated in the formation of welfare opinions, when citizens encounter cues that these emotion programs evolved to process. To risk oversimplification, just as we have evolved specializations that cause us to fear snakes and spiders, we evolved specializations that make us angry at the lazy but compassionate toward the needy. In this way, with evolved cognitive and emotion programs as the intermediate link, the configuration of past adaptive problems is responsible for structuring aspects of public opinion on present political issues in a way that has not been widely appreciated. That is, public opinion turns out to be sensitive to cues that were relevant for social navigation in ancestral small groups—even though these cues might not be important (or may even be counterproductive) to respond to in modern societies. In the case of welfare, it is the perception of welfare recipients' motivation to work, and not their competence, that is the more powerful determinant of welfare opinion. From an economic perspective, modern technologically based advanced societies place a premium on an individual's competence, but the moral intuitions of their citizens do not.

These results help elucidate the psychological mechanisms through which modern individuals form opinions about whether welfare recipients merit assistance. Given the evolutionarily longstanding selection pressures for discriminating between cheaters and noncheaters, we hypothesized that the structure of these emotional mechanisms is species-typical. That is, individual variations in their operations should be relatively small and randomly distributed (Tooby & Cosmides, 1990). Consistent with this argument, we have demonstrated that anger and compassion operate in equal ways across people with different ideologies and different national backgrounds. However, while individual and cross-national

differences do not change the structure of the emotional mechanisms, we do not in any way intend to say that such differences are unimportant (see, e.g., Alford, Funk, & Hibbing, 2008; Jost, Nosek, & Gosling, 2010). Rather, we want to emphasize that their importance rests in providing input to these and other mechanisms in the absence of any externally provided and vivid cues about, for example, specific welfare recipients. In such situations, we should expect our emotional systems to fall back on extracting the cues necessary for their execution from internally provided perceptions, images, and stereotypes about the motivations of welfare recipients (see, e.g., Petersen, 2009; Petersen et al., 2011). Such perceptions are most likely colored by ideology-relevant differences in personality relating to, for example, right-wing authoritarianism (Altemeyer, 1988) and social dominance orientation (Sidanius & Pratto, 2001). In that regard, the implication of the current study is that, to the extent such personality differences influence perceptions of effort among social welfare recipients, they will influence political attitudes on social welfare by regulating a distinct set of social emotions, anger and compassion.

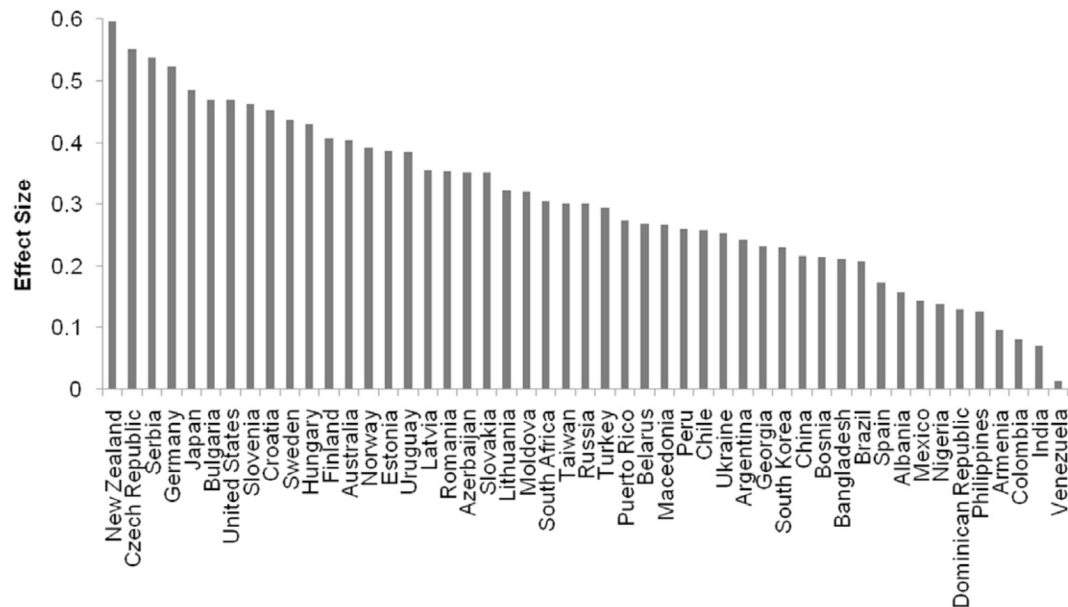
Given that at least some of the above-mentioned personality differences rest on genetically heritable traits, the heritability of opinions on economic equality (Bell, Schermer, & Vernon, 2009) could reflect processes of reactive heritability operating through the species-typical mechanisms of anger and compassion (Tooby & Cosmides, 1990). That is, because heritable individual differences could influence the propensity to view others as cooperatively motivated absent vivid cues, the sensitivity to cues of motivation in the anger and compassion programs would make these heritable differences influence welfare opinions reactively. In that way, species-typical mechanisms and individual differences (heritable and nonheritable) that serve as input to these mechanisms can interact in generating political behavior and orientations. By elucidating the structure of the psychological mechanisms that mediate between inputs and outputs, evolutionary psychological research facilitates the study of this interaction by helping identify which differences could serve as input to a specific mechanism and, hence, create differences in output.

Not only individual-level differences but also structural differences at the national level can serve as input to evolved species-typical mechanisms such as anger and compassion programs. Empirically, we have made use of samples from Denmark and the United States. One of many differences between these two countries relates to racial and ethnic homogeneity. Denmark is relatively homogeneous, and neither race nor ethnicity plays a major role in discussions on social welfare (Larsen, 2006). In contrast, the United States is highly heterogeneous and, in addition, a disproportionately large number of black Americans are on social welfare (Alesina et al., 2001). By implication, race plays a key role in opinions on social welfare in the United States, and white Americans' opposition to social welfare seems to be driven primarily by the perception that black Americans are lazy (Gilens, 1999). This difference provides an illustration of how macrostructural conditions shape our behaviors through a number of interacting psychological mechanisms. Previous research in evolutionary psychology suggests that the human mind does not include a dedicated system for categorizing by race. Instead, differences in appearance associated with race are picked up by psychological mechanisms designed for tracking coalitions more broadly, creating or enhancing mental categories of race and ethnicity (Kurzban, Tooby, & Cosmides, 2001). Moreover, motivational mechanisms prompt individuals to think intuitively of reciprocal social exchanges as organized along coalitional lines (Yamagishi, Jin, & Kiyonari, 1999). In the minds of white Americans, the interaction of these two sets of mechanisms would tag social welfare recipients as unlikely to reciprocate given their disproportionate affiliation with another coalition. Moreover, this information would be fed into the anger and compassion systems, down-regulating support for social welfare. In contrast, in Denmark, the larger racial homogeneity implies that social welfare recipients are more likely to be tagged as comembers of one's coalition and, hence, support for social

welfare is on average strong (see, e.g., Larsen, 2006, for evidence of these differences in welfare support among Danes and Americans).

The present findings contribute to extant research in a number of ways. First and foremost, they contribute to the political science literature on deservingness and social welfare by offering an explanation of how and why perceptions of whether recipients are lazy or not so strongly color public opinion on social welfare. Essentially, the phenomena of modern social welfare activate emotional and cognitive systems designed for regulating ancestral small-scale exchange of help and, given the selection pressures operating on these systems, they are particularly sensitive to effort-related information. Second, the findings contribute to the larger psychological literature on deservingness by showing that (in the domain of help and giving) lack of control in the form of chronic incompetence does not translate into greater deservingness (as some theories predict). For the activation of anger or compassion, competence or lack thereof appears irrelevant; but when incompetence is coupled with noncooperative motivations the avoidance-oriented emotion of contempt is triggered. Third, these findings contribute to the psychological and political science literature on emotions. This study demonstrates the need for political researchers to make fine-grained distinctions between emotions, taking their functions and their evolved information processing designs into account. Most prior research on emotions in political science has focused on emotional valence, i.e., whether the emotions are positive or negative (e.g., Brader, Valentino, & Suhay, 2008; Kuklinski, Riggall, Ottati, Schwarz, & Wyer, 1991; Lodge and Taber, 2005; Marcus et al., 2000; Sniderman et al., 1991). While some recent research has distinguished between different types of negative emotions, this research has still treated anger, contempt, and disgust (for example) as equivalents (see, e.g., Marcus et al., 2006). In line with the argument that distinct emotions are designed to solve distinct problems, we have demonstrated this to be problematic. Moreover, prior research on emotions has generally focused on precautionary emotions such as anxiety (cf. Marcus et al., 2000). Such a focus underestimates the importance of other emotions to public opinion formation. If modern mass politics is represented using evolved mechanisms designed to manage social interactions in small-scale societies, public opinion should be especially influenced by social emotions. If the present findings are a reliable indication, this is indeed the case.

## APPENDIX

**Figure A1.**

Perceiving poverty as caused by laziness correlates significantly with opposition against government involvement in poverty reduction in 48 out of 49 countries. Zero-order correlations.

*Notes.*  $N = 59,144$ . Data is from the World Values Survey 1994–1999 and the variables are e131 (“Why are people in need? Because of laziness and lack of willpower or because of an unfair society?”) and e133 (“How much is the government doing against poverty? Too much, about the right amount or too little?”) in the European and World Values Surveys four-wave integrated data file, 1981–2004. Subjects in the categories “other answers” have been deleted from the analysis. All correlations except for the Dominican Republic and Venezuela are significant at the .001-level. The correlation for the Dominican Republic is significant at the .05-level, while the  $p$ -value for Venezuela is  $p = .67$ .

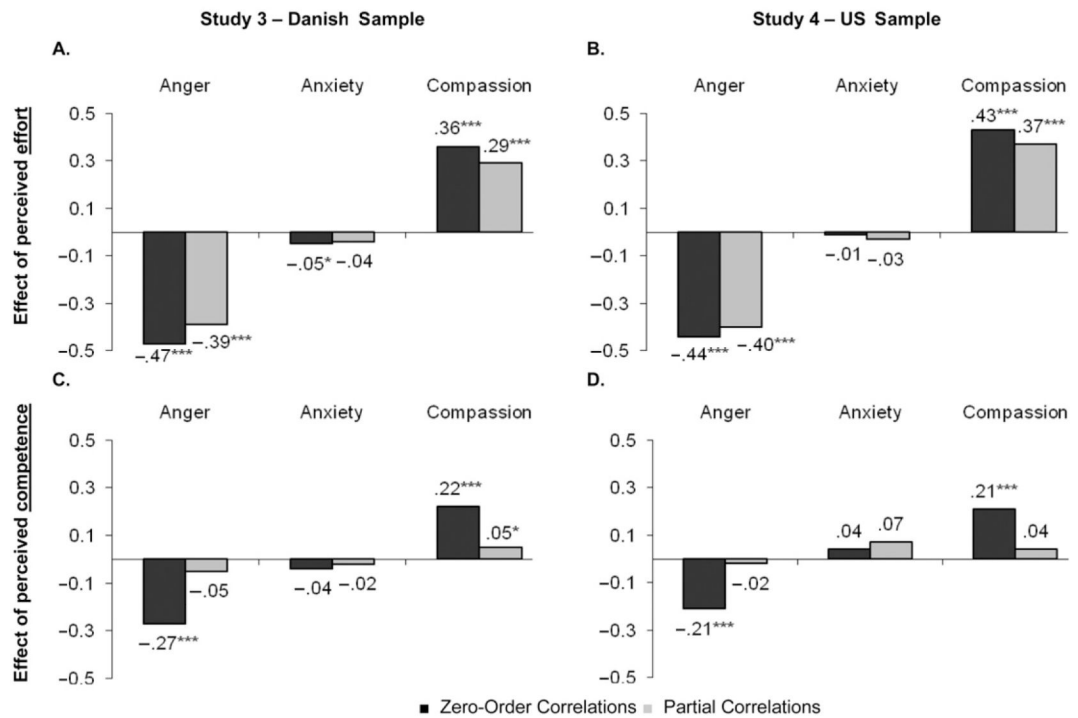
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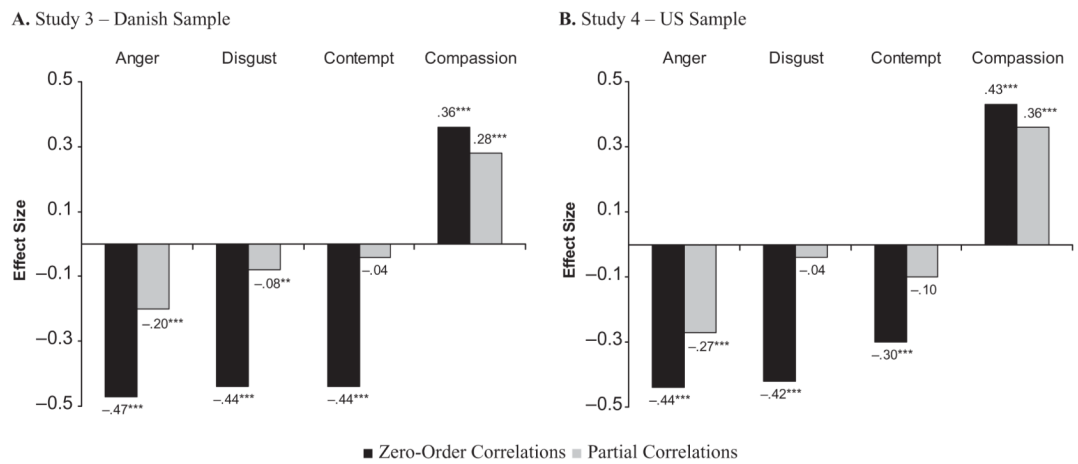
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**Figure 1.** The effect of perceptions of welfare recipients’ effort and competence on anger, anxiety, and compassion towards welfare recipients. Zero-order and partial correlations (controlled for the other perception).  
*Notes.*  $N = 1421$  (Study 3)/ $266$  (Study 4). The partial correlations control for perceptions of welfare recipients’ effort. Stars indicate whether correlation is significantly different from zero (two-tailed tests). \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .





**Figure 2.** The effect of perceptions of welfare recipients’ effort on feelings of anger, contempt, disgust, and compassion towards welfare recipients. Zero-order and partial correlations. *Notes.*  $N = 1421$  (Study 3)/ $266$  (Study 4). The partial correlations have been controlled for the effects of the three other emotions (e.g., the correlation between effort perceptions and anger has been controlled for contempt, disgust, and compassion) as well as perceptions of welfare recipients’ competence. Stars indicate whether correlation is significantly different from zero (two-tailed tests). \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 1**

## Overview of Predictions

#	Prediction
1	Feelings of compassion toward welfare recipients increase support for welfare.
2	Feelings of anger, contempt and disgust towards welfare recipients decrease support for welfare.
3	Feelings of anxiety when thinking about welfare recipients have little or no effect on support for welfare.
4	Feelings of anger, contempt, and disgust to welfare recipients make opinion formation on welfare issues faster.
5	Feelings of compassion for welfare recipients make opinion formation on welfare issues faster.
6	Feelings of anxiety when thinking about welfare recipients do not make opinion formation on welfare issues faster.
7	Ideological predisposition does not influence the speed with which individuals form opinions on welfare issues.
8	Welfare recipients with little motivation to look for work elicit anger.
9	Welfare recipients motivated to look for work elicit compassion.
10	The activation of anger partially mediates the effect of effort cues on support for welfare.
11	The activation of compassion partially mediates the effect of effort cues on support for welfare.
12	Compassion and anger mediate the opinion effects of effort cues independently of political ideology.
13	Cues of effort regulate anger (and compassion) rather than anger-related emotions such as anxiety, contempt, and disgust.
14	Anger and compassion are regulated by cues of effort rather than by effort-related cues of competence.

**Table 2**

The Effect of Emotional Reactions to Welfare Recipients and Ideology on Opinion on Welfare Issues (Models 1 and 2) and Response Times When Forming Welfare Opinions (Models 3 and 4)

	Welfare Opinion		Response Time	
	Model 1	Model 2	Model 3	Model 4
Intercept	.41 *** (.03)	.21 *** (.02)	.47 *** (.04)	.46 *** (.05)
Sex (male)	.03 ** (.01)	.00 (.01)	.03 (.02)	.03 (.02)
Age	.002 *** (.000)	.003 *** (.000)	.002 *** (.001)	.002 *** (.001)
Education	-.16 *** (.02)	-.15 (.02)	-.03 (.03)	-.03 (.03)
Aversion Scale	-.19 *** (.03)	-.07 ** (.03)	-.10 * (.03)	-.10 * (.05)
Compassion Scale	.29 *** (.02)	.19 *** (.02)	-.09 ** (.03)	-.09 ** (.03)
Anxiety Scale	-.05 (.03)	-.05 (.03)	.02 (.05)	.02 (.05)
Ideology	–	.45 *** (.02)	-.04 (.03)	.001 (.15)
Ideology * Ideology	–	–	–	-.04 (.14)
R2 (adj.)	.25	.46	.02	.02

Notes.  $N = 1356$ . Unstandardized OLS regression coefficients, standard errors in parentheses. All variables, except age, vary between 0 and 1. Age is measured in years.

\*  
 $p < .05$

\*\*  
 $p < .01$

\*\*\*  
 $p < .001$ .

Table 3

Anger and Compassion as Mediators of Effort Cues

Dependent Variable	1	2	3	4	5	6	7
Model							
Intercept	.57 <sup>***</sup> (.03)	.23 <sup>***</sup> (.03)	.60 <sup>***</sup> (.04)	.58 <sup>***</sup> (.06)	.80 <sup>***</sup> (.06)	.35 <sup>***</sup> (.06)	.39 <sup>***</sup> (.06)
Experimental Manipulation							
Lazy Recipient	.20 <sup>***</sup> (.05)	.26 <sup>***</sup> (.04)	-.20 <sup>***</sup> (.05)	.09 (.05)	.04 (.08)	.34 <sup>***</sup> (.08)	-.15 <sup>*</sup> (.08)
Unlucky Recipient	-.22 <sup>***</sup> (.05)	-.11 <sup>*</sup> (.04)	.15 <sup>**</sup> (.05)	-.16 <sup>***</sup> (.04)	-.47 <sup>***</sup> (.08)	-.17 <sup>*</sup> (.07)	.22 <sup>**</sup> (.08)
Anger	-	-	-	.34 <sup>***</sup> (.08)	-	-	-
Compassion	-	-	-	-.15 <sup>*</sup> (.07)	-	-	-
Ideology	-	-	-	-	-.58 <sup>***</sup> (.12)	-.30 <sup>**</sup> (.11)	.53 <sup>**</sup> (.12)
Ideology <sup>*</sup> Lazy Recipient	-	-	-	-	.40 <sup>*</sup> (.17)	-.24 (.16)	-.12 (.18)
Ideology <sup>*</sup> Unlucky Recipient	-	-	-	-	.64 <sup>***</sup> (.17)	.13 (.16)	-.15 (.18)
R <sup>2</sup> (adj.)	.30	.28	.21	.42	.37	.37	.33

Notes. N= 199. Unstandardized OLS regression coefficients, standard errors in parentheses. The control condition is the reference category to which the experimental manipulations are compared. The experimental manipulations are entered as dummy variables measuring whether the subject has (1) or has not (0) been treated with the given manipulation. All variables vary between 0 and 1.

\* p < .05

\*\* p < .01

\*\*\* p < .001.