Life History, Code of Honor, and Emotional Responses to Inequality in an Economic Game

AQ: 1

AQ: au

Eric J. Pedersen, Daniel E. Forster, and Michael E. McCullough
University of Miami

The code of honor, which is characterized by a preoccupation with reputation and willingness to take retaliatory action, has been used extensively to explain individual and cultural differences in peoples' tendencies to behave aggressively. However, research on the relationship between the code of honor and emotional responses to social interactions has been limited in scope, focusing primarily on anger in response to insults and reputational threats. Here we broaden this scope by examining the relationship between code of honor and emotional reactions in response to an unfair economic exchange that resulted in unequal monetary earnings among 3 laboratory participants. We found that endorsement of the code of honor was related to anger and envy in response to unfair monetary distributions. Interestingly, code of honor predicted envy above and beyond what could be accounted for by anger, but the converse was not the case. This suggests that the code of honor influenced perceptions of how subjects viewed their own earnings relative to those of others, which consequently was responsible for their apparent anger as a result of the economic transaction. Furthermore, the unique relationship between code of honor and envy was present only for subjects who received unfair treatment and not for subjects who merely witnessed unfair treatment. Additionally, we replicated previous findings that harsh childhood environmental conditions are associated with endorsement of the code of honor, highlighting the potential value of incorporating a life history theoretical approach to investigating individual differences in endorsement of the code of honor.

AQ: 2

Keywords: culture of honor, anger, envy, unfairness, childhood environment

Supplemental materials: http://dx.doi.org/10.1037/a0036752.supp

The *code of honor* is a social-psychological syndrome characterized by a preoccupation with social reputation and endorsement of violence in response to reputational threats. Social scientists have speculated that the code of honor is a contingent social strategy that suits people well to living in so-called cultures of honor (in which rates of interpersonal violence are high and institutional controls are low; Anderson, 1999; Nisbett & Cohen, 1996). In previous work, individual differences in endorsement of the code of honor have predicted several important social outcomes, including criminal behavior and violence (Brezina, Agnew, Cullen, & Wright, 2004), internalization of aggression norms (Cohen, Vandello, Puente, & Rantilla, 1999; Vandello, Cohen, & Ransom, 2008), and exploitation and retaliation in laboratory interactions with strangers (McCullough, Pedersen, Schroder, Tabak, & Carver, 2013).

To date, researchers who have quantitatively investigated the code of honor have mostly focused on behavioral outcomes (e.g., violence, criminal behavior) rather than on people's emotional responses to specific social interactions that might be particularly relevant to the code of honor. The few studies conducted to investigate the emotional effects of the code of honor have mainly been focused on anger in response to insults (Cohen, Nisbett, Bowdle, & Schwarz, 1996; Cohen et al., 1999; IJzerman, van Dijk, & Gallucci, 2007; Rodriguez Mosquera, Fischer, Manstead, & Zaalberg, 2008) and hypothetical confrontations (Rodriguez Mosquera, Manstead, & Fischer, 2000, 2002). The relative lack of research investigating emotions other than anger, and social interactions other than direct competitive or aggressive interactions, may belie the code of honor's important influences on social interactions of many different varieties—that is, investigating specific emotional responses and contexts that elicit them can shed further light on the psychological processes that underlie the code of honor and the behaviors it is particularly effective at motivating.

In the present work, we tested whether endorsement of the code of honor was associated with anger—and, more crucially, envy—in response to unfairness in an economic game that resulted in monetary inequality among three laboratory participants. Furthermore, we tested whether endorsement of the code of honor exacerbated people's feelings of envy specifically in response to receiving—rather than merely observing—unfair treatment; by doing so, we were able to examine whether endorsing the code of honor produces emotional responses to monetary inequality gen-

erally or whether, instead, it produces emotional responses only to inequalities that the self has incurred. Additionally, we sought to replicate earlier evidence (McCullough et al., 2013) that exposure to harsh childhood environments is associated with individual differences in endorsement of the code of honor.

Life History, Childhood Environmental Characteristics, and the Code of Honor

Much of the scholarly work on the code of honor has come from cultural psychologists and other social scientists interested in the cultural conditions that evoke the code of honor (Anderson, 1999; Black-Michaud, 1975; Nisbett & Cohen, 1996; Rodriguez Mosquera et al., 2000; Vandello et al., 2008). This cultural-differences approach comports well with a branch of evolutionary theorizing called life history theory (Belsky, 2012; Belsky, Steinberg, & Draper, 1991; Daly & Wilson, 2005; Hill, Jenkins, & Farmer, 2008; Kaplan & Gangestad, 2005).

Life history theory recognizes that all organisms face a fundamental problem: How should time, energy, and other resources be allocated to various activities and developmental processes related to survival and reproduction? Because resources are finite, there are inevitable tradeoffs that organisms must negotiate (e.g., time spent foraging for food cannot be spent searching for mates; energy allocated to muscle growth comes at the expense of energy allocated to immune function). An individual's *life history strategy* is conceptualized as its approach to managing the tradeoff between current reproductive effort and future reproductive effort. Individuals that allocate a large proportion of resources to current reproduction at the expense of future reproduction are categorized as having *faster* life history strategies, whereas those that allocate a large proportion of resources to future reproduction at the expense of current reproduction are categorized as having *slower* life history strategies. Whether an individual adopts a slow or fast strategy depends on a variety of environmental characteristics, including extrinsic risks of harm or death, predictability of environmental resources and hazards, and the intensity of competition over available resources (Ellis, Figueredo, Brumbach, & Schlomer, 2009; Griskevicius, Tybur, Delton, & Robertson, 2011). That is, the harsher the environment, the more advantageous it might be to invest resources in current reproductive effort—a *faster* life history strategy—because the likelihood of benefitting from longer-term resource investments is diminished (i.e., resources might become even more scarce or the organism might die before reproducing; Belsky et al., 1991; Daly & Wilson, 2005).

Due to the wide range of global environments that humans have succeeded in inhabiting over the course of their evolutionary history, it is reasonable to expect that natural selection has produced physiological and psychological mechanisms that calibrate human behavioral tendencies in response to fitness-relevant environmental characteristics (including social ones) that vary across ecologies (Belsky et al., 1991; Nettle, Colle, & Cockerill, 2011; Tooby & Cosmides, 1990). More specifically, it is plausible that the human mind has evolved to use harsh environmental conditions (e.g., local mortality rate and resource scarcity) as cues that life could be short and difficult. This hypothesis has been supported in numerous studies. For example, women's ages at first conception are lower, and people's rates of violence are higher, in neighborhoods with low life expectancies (Wilson & Daly, 1997).

Also, people from homes in which nurturance, discipline, and parental care were inconsistent, or from neighborhoods in which violence and economic disadvantage were high, engage in more impulsive and risky behavior as young adults (Belsky et al., 1991; Hill et al., 2008), which is to be expected when one perceives that life is likely to be short and harsh (Daly & Wilson, 2005).

Researchers have also discovered that harsh environments—in which rates of interpersonal violence are high and policing or other institutional controls are low—are associated with social distrust, a preoccupation with social status and honor, and approval of violent retaliation in response to reputational threat—the characteristics that define the code of honor (Black-Michaud, 1975; Nisbett & Cohen, 1996). For example, Barnes, Brown, and Tamborski (2012) suggested that, due to a preoccupation with status and the related importance of demonstrating strength and fearlessness, people within cultures of honor are characterized by greater risk-taking behaviors, as evinced by higher rates of accidental deaths. These characteristics coincide directly with predictions from life history theory on the adoption of a fast life history strategy (i.e., investing resources in current reproductive effort) in response to harsh, unpredictable environments: *We propose that individuals who endorse the code of honor do so as part of a fast life history strategy in response to harsh environmental conditions* (see also: McCullough et al., 2013). If this hypothesis is correct, investigating relevant environmental conditions can shed light on the sources of individual differences in endorsement of the code of honor, as well as its effects on behavior and emotions.

In the present study, we measured childhood exposure to harsh environmental conditions with three measures that, conceptually, are traditionally associated with the code of honor: exposure to neighborhood crime and violence, perceived efficacy of neighborhood policing, and socioeconomic status. Additionally, we measured childhood exposure to family neglect, conflict, and violence because of its importance for humans from the perspective of life history theory: Until around the time human children reach sexual maturity, they are utterly dependent on the care provided by others, particularly adults in their family. For example, among extant hunter gatherer groups, children do not produce as many calories as they consume (i.e., they depend on others to acquire food for them) until their mid- to late-teens, and only about 60% of children survive until the age of 15 (Kaplan, Hill, Lancaster, & Hurtado, 2000). Furthermore, a quintessential precursor to the adoption of a fast life history strategy is minimal parental investment in offspring (Belsky et al., 1991): from the perspective of a child, the receipt of minimal investment is a cue that life will continue to be harsh (and possibly foreshortened by resource scarcity). Thus, the extent to which a child faces neglect and instability in its family is a strong predictor of survival and should influence the type of life history strategy the child adopts—including, potentially, the code of honor. Indeed, in a previous study, childhood exposure to family neglect, conflict, and violence was a stronger predictor of code of honor endorsement than was exposure to neighborhood crime and violence, perceived efficacy of neighborhood policing, or socioeconomic status (McCullough et al., 2013). In addition to attempting to replicate our previous findings, here we predicted that exposure to harsh childhood environments would also be indirectly associated with anger and envy in response to an unfair economic exchange (see below) via their effects on code of honor endorsement.

Anger, Envy, and the Code of Honor

As noted above, some researchers have discovered a link between endorsement of the code of honor and anger in response to insults and affronts to one's status or reputation (Cohen et al., 1996; IJzerman et al., 2007; Rodriguez Mosquera et al., 2008; Rodriguez Mosquera et al., 2000, 2002). For example, results from several studies suggest that people from honor cultures become angrier (as rated by a confederate) after physical and verbal confrontations than do people who are not from honor cultures (Cohen et al., 1999; IJzerman et al., 2007). In another study, however, researchers found no difference in self-reported anger between honor culture and nonhonor culture participants upon recounting a recent episode of being insulted; nevertheless, people from honor cultures did report a greater inclination to take retaliatory action against an offender than did people who were not from honor cultures (Rodriguez Mosquera et al., 2000).

Although researchers generally agree that endorsement of the code of honor is related to anger in response to insults, the relationship between code of honor and anger in response to monetary inequality resulting from an unfair economic exchange has yet to be studied, despite good reasons for doing so: Reputation, status, and resources—all of which are often distributed unequally among individuals—are conspicuous preoccupations in cultures of honor and among individuals who endorse the code of honor (Anderson, 1999; Cohen & Nisbett, 1994; Nisbett & Cohen, 1996). Therefore, it is reasonable to expect that the code of honor will influence people's anger in response to unfair distributions of material goods. In fact, Henry (2009) found that higher murder rates in regions with cultures of honor (both within the United States and across an international sample), relative to regions without cultures of honor, can be explained by within-region status disparities (based on wealth distribution). Here, we applied a similar approach to a laboratory experiment by manipulating monetary distribution via an unfair economic exchange, and we predicted that endorsement of the code of honor would be associated with anger toward the transgressor.

When investigating anger in response to unfairness, it is prudent to also consider envy, which is typically highly correlated with both anger (Hareli & Weiner, 2002; Pedersen, Kurzban, & Mc-Cullough, 2013) and hostility (Smith & Kim, 2007). Envy is generally considered to result from comparing one's inferior resources or status with those of other people (Feather & Sherman, 2002; Smith & Kim, 2007)—particularly, potential rivals (Hill & Buss, 2006). Researchers have argued that envy is distinct from other emotional responses to unfairness that are based solely on perceptions of injustice, such as resentment (Feather & Sherman, 2002; Leach, 2008). On this view, an injustice must evoke a personally relevant social comparison to elicit envy, but envy can occur without the perception of injustice. In principle, measuring both envy and anger therefore enables researchers to distinguish the emotional effects of perceiving that an injustice has been committed from the emotional effects of perceiving that one's resources compare unfavorably with those of another person.

For example, if the emotional response to an unfair economic exchange is characterized by envy, but not by anger, then one could justifiably conclude that victims and/or witnesses of the unfair treatment were attending to cues that another person has obtained better outcomes than the self, rather than cues that the person had behaved unjustly per se. In previous work, we found that witnesses of an unfair economic exchange who possessed as much money as the transgressor reported less envy (controlling for anger) than witnesses of an unfair exchange who possessed less money than the transgressor (Pedersen et al., 2013). However, participants in the two groups reported equal amounts of anger (controlling for envy), suggesting that envy results from comparing of one's resources to another's, whereas anger results from perceived injustice.

Following roughly the same reasoning that led to our prediction that endorsement of the code of honor would be associated with anger toward a transgressor, we also predicted that endorsement of the code of honor would be associated with envy toward the transgressor. Because those who endorse the code of honor are primarily concerned with status and reputation, and because one's status and reputation depend, in part, on the availability of resources, cues of resource inequality should trigger relevant emotional responses in people that endorse the code of honor. That is, we expected that the emotional reaction to resource inequality would at least be partially characterized by an emotion that is thought to result from social comparisons of the self to others with greater resources (i.e., envy), and that the amount of envy reported would be positively associated with endorsement of the code of honor. Therefore, given that the presence of anger and envy implies the processing of different cues (injustice vs. unfavorable social comparison, respectively), it is particularly important to measure both anger and envy simultaneously so that their unique associations with the code of honor can be distinguished, which can help shed light on the underlying psychological structure of the code of honor.

For example, if the relationship between code of honor and anger holds when controlling for envy, but the reverse (i.e., the relationship between code of honor and envy when controlling for anger) does not, this would suggest that one of the key psychological features of the code of honor is to facilitate the processing of cues related to injustice but not cues related to unfavorable social comparisons (at least in the context of an unfair economic exchange). Conversely, if the relationship between code of honor and envy holds when controlling for anger but the reverse does not, this would suggest that one of the key psychological features of the code of honor is to process cues related to unfavorable social comparisons and not injustice per se. Finally, if both relationships hold, this would suggest that cues of injustice and unfavorable social comparisons are both important psychological characteristics of the code of honor.

The Present Study

In previous work, we found that childhood exposure to family neglect, conflict, and violence, as well as to neighborhood crime and violence, predicted endorsement of the code of honor, particularly for men. In turn, endorsement of the code of honor predicted both exploitation and retaliation in an iterated prisoner's dilemma, and the indirect effects from the childhood environment variables significantly predicted both exploitation and retaliation as well (McCullough et al., 2013). In the present study, we sought to extend this work by: (a) investigating the emotional outputs of the code of honor, which has the advantage of potentially distinguishing which particular cues are important to the code of honor; and

(b) using an experimental economics game that enabled us to test the effects of code of honor endorsement on emotional responses to both directly experiencing and merely witnessing an unfair distribution of resources. Because research on the code of honor has, to date, only focused on reactions to directly experiencing harms or insults, it remains an open question whether the psychological structure of the code of honor is well-designed to respond to directly experienced transgressions, or whether it responds to harms more generally, regardless of whether those harms are directed toward oneself or toward others.

Our goals here were fourfold. First, we replicated some of our previous efforts to examine whether harsh childhood environmental characteristics predict code of honor endorsement—here with a substantially larger sample size. Second, we tested whether endorsement of the code of honor subsequently predicted self-reported anger and envy at monetary inequality stemming from unfairness in an economic game, and also tested the indirect effects of the childhood environment variables on the emotional outcomes. Third, we explored the relationship between anger and envy to determine whether one was uniquely explained by code of honor after controlling for the other. Fourth, we examined whether endorsement of the code of honor differentially predicted anger and envy at unfairness as a function of whether subjects were the recipients of unfairness, or merely witnesses of an anonymous third party's unfair experience.

Method

Subjects

Subjects were 685 (389 female; four unreported) undergraduates at the University of Miami who participated for partial course credit and $9 in compensation. Data for the childhood environment and code of honor measures were collected after three separate experiments via identical questionnaires. One of these experiments (Pedersen et al., 2013) was a 2 (Role: Recipient, Witness) × 2 (Treatment: Fair, Unfair) between-subjects experiment in which subjects played a modified third-party punishment game and reported their emotional reactions to experiencing or witnessing unfairness. We report the methods of this experiment here and omit the details of the other two experiments, which are not relevant to the present article.

Procedure

Subjects were run in individual sessions at a computer station. The entire experiment, including instructions, was conducted on a computer via E-Run with a script created in E-Prime version 2.0. After subjects provided informed consent, they were told they would be interacting with two other players located elsewhere in the building over the computer network, and that it was important that those other people remain anonymous. In fact, subjects interacted with a preprogrammed computer script. Subjects were informed that they would be participating in an economic decision-making game that would last for multiple rounds and they would be paid based on the money they earned during the game. Because deception was involved, all subjects were paid a flat rate of $9 at the end of the experiment, following a debriefing.

The decision-making game comprised two rounds; only the first round is relevant to the present study and described here (for full details, see Pedersen et al., 2013). The game involved three players (only one of which was an actual participant), each endowed with $5 and assigned to one of three roles: Decision Maker, Receiver, or Observer. (We refer to these roles here as Dictator, Recipient, and Third Party, respectively, to be consistent with labels typically used in economic games.) The Dictator ostensibly had the option to give any portion of his or her $5 to the Recipient, or to take any portion of the Recipient's $5; the Third Party would merely see the results of the round and would not be affected by the Dictator's choice. After subjects were randomly assigned to be either the Third Party or the Recipient, the (computer-programmed) Dictator either took $4 (unfair treatment condition) or $0 (fair treatment condition) from the Recipient. To ensure that the effects of the Dictator's decision were clear to subjects, the computer displayed a summary screen showing the amount of money each player earned for the round. Following the round, subjects completed a series of self-report items about their emotional reactions toward the other players (see below). Next, subjects played a second round of the game, with slightly different methodological details that are not relevant here (see Pedersen et al., 2013), and then completed the experiment. Afterward, the experimenter debriefed subjects through an extensive, staged process to assess the believability of the experiment and to explain why deception was necessary (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990).

Measures

Measures contributed by all subjects ($N = 685$).
Exposure to family neglect, conflict, and violence. We measured subjects' perceptions of the extent to which they were exposed to neglect, conflict, and violence in their families during childhood with the mean of 10 items (alpha = .80; based on items from Taylor, Lerner, Sage, Lehman, & Seeman, 2004). The items (e.g., "How often would you say you were neglected while you were growing up, that is, left on your own to fend for yourself?" and "How often did a parent or other adult in the household push, grab, shove, or slap you?") were rated on a 5-point Likert-type scale (1 = *not at all* and 5 = *very often*). This scale was modified from our previous study (McCullough et al., 2013) to include more items; the three other childhood environment scales described below were the same as in the previous study (see supplemental material for exact scales used).

Exposure to neighborhood crime and violence. We measured subjects' perceptions of violence and crime in their childhood neighborhoods with a factor score extracted from the principal components analysis of a seven-item scale (alpha = .85; loadings ranged from .614 to .816 and the resulting factor accounted for 54.15% of the standardized variances of the items). The items (e.g., "Someone being mugged or robbed on the streets," "Someone being injured during a fight so badly that he or she had to go to the hospital," and "Someone's home being burglarized") were rated on a 5-point Likert-type scale (1 = *never* and 5 = *more than 10 times*) in response to the question, "How many times do you remember witnessing or hearing about the following events in your neighborhood when you were growing up?"

Perceived efficacy of neighborhood policing. We measured subjects' perceptions of the efficacy of the police in the neighbor-

hoods in which they grew up with the mean of four items (alpha = .76) based on items from Tyler (2005). The items (e.g., "How effective are the police in your neighborhood in fighting crime?") were rated on 5-point Likert-type scales (e.g., 1 = *totally ineffective* and 5 = *extremely effective*). There was a small effect of experiment on the mean of this scale ($\eta^2 = .025$), such that the mean from one dataset (*M* = 3.86, *SD* = 0.72) was significantly larger than those from the other two, which did not differ from each other (*M* = 3.67, 3.55, *SD* = 0.71, 0.74, respectively). We ran our analyses with the anomalous data removed and found that it did not qualitatively alter the results, so all of the available data were used in the models we report below. None of the means of the other variables differed among experiments.

Socioeconomic status. We measured subjects' socioeconomic status with a modified version of Hollingshead's (1975) social status index, the Barratt Simplified Measure of Social Status (BSMSS; Barratt, 2006), which involves calculations based on subjects' (and their parents') degree of educational attainment and occupational status. We were interested in subjects' socioeconomic status during childhood, so we only incorporated their parents' information here. BSMSS values were divided by 10 so their variance was comparable with the other measures to aid in model convergence.

Code of honor endorsement. We measured endorsement of the code of honor with a factor score based on subjects' scores on three separate scales. The first scale was an "attitudes toward revenge" scale (7 items; alpha = .85) comprising items from previously published scales (Brezina et al., 2004; Eisenberger, Lynch, Aselage, & Rohdieck, 2004) such as "If someone treats me badly, I feel I should treat them even worse." The second scale measured endorsement of "street code" beliefs (10 items; alpha = .81), with items from elsewhere (Brezina et al., 2004; Eisenberger et al., 2004; Stewart, Schreck, & Simons, 2006) such as "Sometimes, you have to fight to uphold your honor or put someone in his or her place." The third scale, which measured attitudes toward forgiveness, included seven items (reverse coded; alpha = .73) from Berry, Worthington, O'Connor, Parrott, and Wade (2005) such as "I try to forgive others even when they don't feel guilty for what they did." The three scales were subjected to a principal components analysis, yielding one factor that accounted for 63% of the standardized variances of the three scales (loadings ranged from .672 to .892). We note that our operationalization of the code of honor, which we created for previous work (McCullough et al., 2013), differs from scales used by other researchers (e.g., Barnes et al., 2012, IJzerman et al., 2007). We sought to complement the

more traditional "street code" scale used here with measures of revenge and forgiveness to capture the extent to which people are unforgiving against personal slights and their willingness to retaliate in turn, which are characteristics ascribed to the code of honor (Brezina et al., 2004; Cohen et al., 1996; Stewart et al., 2006).

Measures contributed by subjects in economic game (*N* = 292).

Self-rated emotions toward the other players. After the first round of the economic game, subjects were asked to describe their emotions toward both of the other players. They described their feelings toward both players to avoid demand effects that might have occurred by probing only about the Dictator. Emotional reactions to the other player (non-Dictator) were not of theoretical interest here, nor was the experiment designed to test reactions toward this player, so we did not analyze those data.

Anger. We measured anger with the mean of three items (alpha = .94): Subjects rated the extent to which they were "angry," "mad," and "outraged" at the Dictator on a scale from 0 (*not at all*) to 5 (*extremely*).

Envy. We measured envy with the mean of two items (alpha = .84): Subjects rated the extent to which they were "envious" and "jealous" of the Dictator on a scale from 0 (*not at all*) to 5 (*extremely*).

Results

Subjects flagged for suspicion during debriefing (*n* = 22) were excluded from all analyses presented; reincluding them in analyses did not qualitatively affect the results in any way (see supplemental material). See Table 1 for descriptive statistics and correlations **T1** among study variables. We conducted path models in Mplus Version 6 (Muthén & Muthén, 1998–2010) using maximum likelihood estimation; missing data were handled with full information maximum likelihood (FIML).

Overall Model

First, we constructed a model to test whether the childhood environment variables predicted endorsement of the code of honor (i.e., to replicate findings from McCullough et al., 2013) and, in turn, predicted anger and envy in the economic game (see Figure **F1** 1 for path model). The model fit the data well: $\chi^2(8) = 7.17$, *p* = .518; RMSEA = 0; 90% CI [0.00, 0 .43], *p* = .98; CFI = 1; SRMR = 0.03. Childhood exposure to family neglect, conflict, and violence (*b* = 0.28, *SE* = 0.07, *p* < .001, 95% CI [0.14, 0.41])

Table 1

Descriptive Statistics and Correlations Among Variables

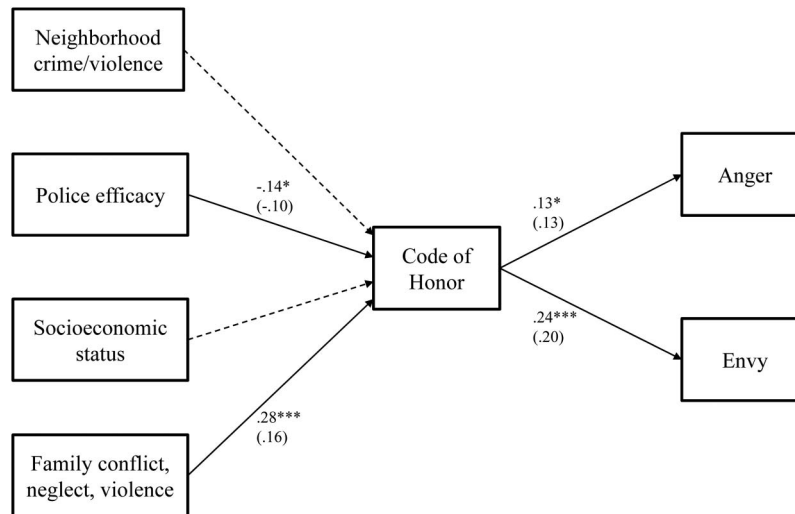| Variable	Range	*M*	*SD*	1	2	3	4	5	6	7
1. Neighborhood crime/violence	−1.25–3.68	0.00	1.00							
2. Police efficacy	1.00–5.00	3.72	0.73	−.32**						
3. Socioeconomic status	0.60–6.60	5.21	1.25	−.05	.13**					
4. Family conflict, neglect, violence	1.00–4.20	1.92	0.57	.13**	−.09*	−.08*				
5. Code of honor	−2.24–3.38	0.01	1.01	.09*	−.13**	−.02	.17**			
6. Anger	0.00–4.67	0.63	1.03	−.06	−.03	.13*	.03	.13*		
7. Envy	0.00–5.00	0.86	1.19	−.04	.02	.13*	.02	.20**	.64**	

* *p* < .05. ** *p* < .01.

Figure 1. Path model linking characteristics of childhood environment with anger and envy toward Dictator. Standardized coefficients are in parentheses. (Variances and covariances omitted for clarity; see supplemental material Table S1 for complete results). * $p < .05$. *** $p < .001$.

and perceived efficacy of neighborhood policing ($b = -0.14$, $SE = 0.06$, $p = .012$, 95% CI $[-0.26, -0.03]$) significantly predicted endorsement of the code of honor in theoretically expected ways (the former replicated a previous finding, the latter was novel; McCullough et al., 2013). Moreover, endorsement of the code of honor was positively associated with both anger ($b = 0.13$, $SE = 0.06$, $p = .037$, 95% CI $[0.01, 0.25]$) and envy ($b = 0.24$, $SE = 0.07$, $p = .001$, 95% CI $[0.10, 0.37]$) toward the dictator in the economic game. Both childhood exposure to family neglect, conflict, and violence ($b = 0.07$, $SE = 0.03$, $p = .010$, 95% CI $[0.02, 0.11]$) and perceived efficacy of neighborhood policing ($b = -0.03$, $SE = 0.02$, $p = .044$, 95% CI $[-0.07, 0.00]$) apparently obtained significant indirect associations with envy via their intermediate associations with endorsement of the code of honor. (Note, however, that the zero-order correlations between these childhood variables and anger and envy were not significant.) The pattern of results was similar, but did not reach statistical significance, for the indirect effects of childhood exposure to family neglect, conflict, and violence ($b = 0.04$, $SE = 0.02$, $p = .064$, 95% CI $[0.00, 0.07]$) and perceived efficacy of neighborhood policing ($b = -0.02$, $SE = 0.01$, $p = .108$, 95% CI $[-0.04, 0.00]$) on anger. Neither childhood exposure to neighborhood violence and crime (contrary to a previous finding; McCullough et al., 2013) nor socioeconomic status was associated with endorsement of the code of honor (ps > .320).

In previous work, we found that the relationship between the childhood environment variables and the code of honor was particularly strong in men (McCullough et al., 2013). To examine sex differences in the present study, we conducted a multiple group comparison between men and women (see supplementary material; Sauer & Dick, 1993). We found that men had a significantly higher intercept of code of honor endorsement (0.38) and residual variance of anger (1.29) than did women (−0.18 and 0.86, respectively; ps < .02). By constraining the intercept of code of honor endorsement to be equal between sexes and probing its significant predictors, we found that the path from family neglect, conflict and

violence was moderated by sex ($p < .001$), implying that exposure to family neglect, conflict, and violence as child was more strongly (and positively) related to endorsement of the code of honor for men ($b = 0.45$, $SE = 0.07$, $p < .001$, 95% CI $[0.31, 0.59]$) than it was for women ($b = 0.19$, $SE = 0.07$, $p = .004$, 95% CI $[0.05, 0.33]$). Additionally, the path from efficacy of neighborhood policing was moderated by sex ($p < .001$), implying that the perception that the police were more involved in one's neighborhood was more strongly (and negatively) related to endorsement of the code of honor for women ($b = -0.21$, $SE = 0.06$, $p < .001$, 95% CI $[-0.33, -0.09]$) than it was for men ($b = -0.06$, $SE = 0.06$, $p = .298$, 95% CI $[-0.18, 0.06]$). The subsequent direct effects from code of honor endorsement to anger and envy did not differ between the sexes. We did not test for any additional sex differences; all subsequent models were estimated with both sexes simultaneously.

The Relationship of Anger and Envy

To test whether code of honor endorsement predicted anger beyond what could be accounted for by its effects on envy, we added a path from envy to anger (the rest of the model, and fit statistics, remained the same). In this model, the path from envy to anger was significant ($b = 0.55$, $SE = 0.04$, $p < .001$, 95% CI $[0.47, 0.64]$) and the path from code of honor to anger, which had been significant in the previous model, was no longer significant ($b = 0.00$, $SE = 0.05$, $p = .981$, 95% CI $[-0.10, 0.10]$). However, reversing the direction of the path, so that anger predicted envy, did not have the same effect: the path from anger to envy was significant ($b = 0.71$, $SE = 0.05$, $p < .001$, 95% CI $[0.61, 0.82]$) and the path from code of honor to envy also remained significant ($b = 0.14$, $SE = 0.06$, $p = .009$, 95% CI $[0.04, 0.25]$; see supplemental material Tables S3 and S4 for full results of both models). Thus, the extent to which endorsement of the code of honor predicted anger at the dictator in the economic game could be entirely accounted for by code of honor's effect on envy, but the

reverse was not true: The extent to which endorsement of the code of honor predicted envy could not be fully accounted for by code of honor's effects on anger. Because of this asymmetric relationship, we retained the model in which envy predicted anger to test the effects of the economic game conditions on both envy and the unique components of anger that cannot be accounted for by its high covariation with envy (Pedersen et al., 2013).

Economic Game Conditions

We added the conditions of the economic game as dummy-coded predictors of anger and envy to the model to examine whether endorsement of the code of honor differentially predicted anger and envy based on condition in the 2 (Role: Recipient, Witness) × 2 (Treatment: Fair, Unfair) design. Recipients and observers of fairness did not differ on any relevant variables, so we combined them into a single control group coded as the referent group. Thus, we added four dummy-coded variables to the model in which envy predicted anger (see Figure 2): recipient of unfairness, observer of unfairness, a product-interaction term reflecting the effects of code of honor endorsement specifically for recipients of unfairness (Recipient × Code of Honor), and a product-interaction term reflecting the effects of code of honor specifically for observers of unfairness (Observer × Code of Honor). The dummy-coded variables reflecting membership in the "recipient of unfairness" and "observer of unfairness" conditions were specified to have direct paths to both anger and envy, and were correlated with the residual variance in code of honor endorsement, following the moderated mediation approach outlined by Preacher, Rucker,

and Hayes (2007). The model fit the data well: $\chi^2(8) = 10.42$, $p = .233$; RMSEA = 0.02; 90% CI [0.00, 0.54]; CFI = 1, SRMR = 0.03. In this model, the direct effects of code of honor on anger and envy were no longer significant (ps > .24; see Figure 2 and supplemental material Table S5).

Anger toward the dictator. In this model, anger was significantly predicted by envy ($b = 0.44$, $SE = 0.04$, $p < .001$, 95% CI [0.35, 0.52]) and the dummy-coded "recipient of unfairness" variable—that is, the variable representing membership in the recipients of unfairness condition—were significantly angrier toward the dictator than were controls (recipients and witnesses of fairness), $b = 0.87$, $SE = 0.12$, $p < .001$, 95% CI [0.63, 1.11]. Observers of unfairness were not angrier toward the dictator than were controls ($p = .162$), and neither the Recipient × Code of Honor nor the Observer × Code of Honor interactions significantly predicted anger (ps > .054).

Envy toward the dictator. We found significant direct effects from both the recipient ($b = 1.13$, $SE = 0.15$, $p < .001$, 95% CI [0.83, 1.43]) and observer ($b = 1.17$, $SE = 0.15$, $p < .001$, 95% CI [0.87, 1.46]) dummy variables to envy: Both recipients and observers of unfairness reported more envy toward the dictator than did people in the control condition (i.e., recipients and observers of fairness). Additionally, the Recipient × Code of Honor interaction significantly predicted envy ($b = .43$, $SE = 0.14$, $p = .003$, 95% CI [0.15, 0.71]) whereas the Observer × Code of Honor interaction did not ($p = .914$). Thus, for recipients of unfairness, degree of endorsement of the code of honor was positively related to envy toward the unfair dictator (who had $9 to the subject's $1).
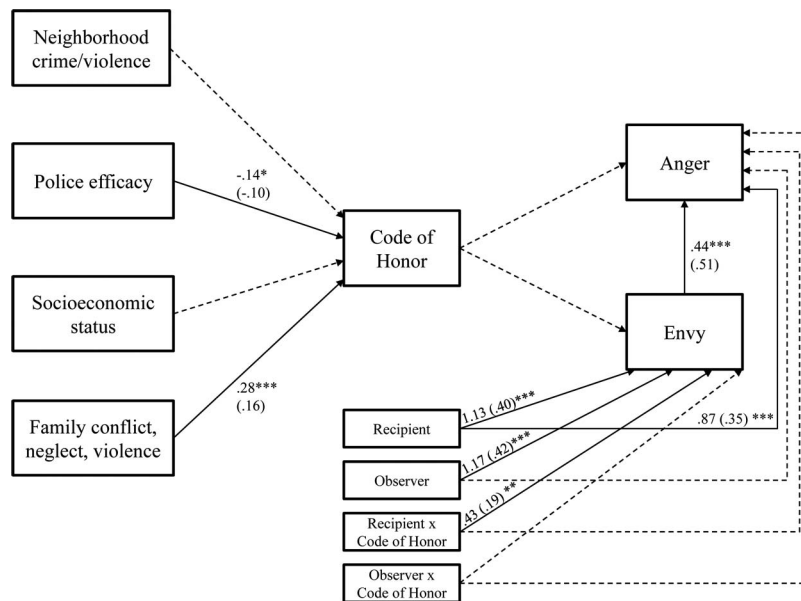

Figure 2. Path model with experimental conditions added. Standardized coefficients are in parentheses. (Variances and covariances omitted for clarity; see supplemental material Table S4 for complete results). With the experimental conditions added to the model, the direct effects from code of honor to anger and envy were not significant. There was a significant Recipient × Code of Honor interaction such that degree of endorsement of the code of honor was positively related to envy toward the unfair Dictator. In contrast, for people who merely observed the Dictator treat the third party, degree of endorsement of the code of honor was not related to envy toward the unfair Dictator. * $p < .05$. ** $p < .01$. *** $p < .001$.

In contrast, for people who merely observed the dictator treat the third party unfairly (and consequently ended with $9 in comparison with subject's $5), degree of endorsement of the code of honor was not related to envy toward the unfair dictator. Thus, endorsement of the code of honor appears to increase participants' envy toward dictators who obtained an unfair economic advantage by treating those participants themselves unfairly, but it does not appear to increase participants' envy toward dictators who obtained their unfair advantage by treating an anonymous third party unfairly.

Discussion

Although researchers have investigated the code of honor extensively (e.g., Cohen & Nisbett, 1994; Cohen et al., 1996; IJzerman et al., 2007; Rodriguez Mosquera et al., 2002), to date the role of the code of honor and its relationships with emotional reactions have not been studied in the context of an unfair economic exchange. Because of the preoccupation with reputation, status, and resources among those who embrace the code of honor, an unfair economic exchange provides an opportunity to examine the relationships among the code of honor, anger, and envy in response to inequality, and thus shed light on some of the psychological characteristics that underlie the code of honor. As predicted, we found that endorsement of the code of honor was associated with both anger and envy in response to unfairness in an economic game. Interestingly, code of honor predicted envy above and beyond what could be accounted for by anger, but the converse was not the case. This pattern of findings suggests that the code of honor influenced perceptions of how subjects viewed their own resources relative to those of the anonymous dictator, which consequently was responsible for their anger as a result of the economic transaction. Thus, it seems that one of the key features of the code of honor is to focus people's attention on cues that their social status has been diminished, presumably to motivate people to take ameliorative action. This finding is consistent with previous research on the association between anger and code of honor in response to insults and other affronts to one's status (Cohen et al., 1996; Cohen et al., 1999; IJzerman et al., 2007; Rodriguez Mosquera et al., 2008; Rodriguez Mosquera et al., 2000, 2002), in which cases anger presumably functions to motivate individuals to take actions that deter future behavior that is viewed as unjust—at least from the perspective of the angry individual (see also: Sell, 2011).

Furthermore, endorsement of the code of honor increased envy among subjects who received unfair treatment, but it did not appear to have any such effect on envy among participants who merely witnessed unfair treatment. This result suggests that, at least in the context of resource inequality, the code of honor is shaped to respond *specifically* to transgressions directed toward oneself, rather than to transgressions directed toward others. Although this finding is consistent with previous research on the association between code of honor and anger in response to directly experienced insults and affronts to one's status, no research to date had tested whether the code of honor is associated with emotional reactions to witnessed transgressions.

Additionally, the present study partially replicated previous findings regarding the childhood predictors of code of honor endorsement, and also extended them by finding indirect associa-

tions between the childhood predictors and envy (via code of honor) in response to resource inequality. In previous work, we found that both exposure to childhood family neglect, conflict, and violence, as well as exposure to neighborhood crime and violence, predicted endorsement of the code of honor (McCullough et al., 2013). In contrast, in the present study we found that exposure to family neglect, conflict, and violence predicted code of honor endorsement, whereas exposure to neighborhood crime and violence did not. Also, unlike in our previous study (McCullough et al., 2013), here we found that the perceived efficacy of neighborhood policing predicted endorsement of the code of honor among women (although not among men), which is at least somewhat consistent with previous arguments suggesting that effective neighborhood policing tends to negatively predict the prevalence of retaliatory homicide (Kubrin & Weitzer, 2003). Taken as a whole, then, the present results partially, but imperfectly, replicate the results from our previous work on the family and neighborhood predictors of endorsement of the code of honor (McCullough et al., 2013).

One possibility seems particularly relevant to explaining these differences between the present results and those of McCullough et al., (2013): Here we used a different version of the family neglect, conflict, and violence scale that, although conceptually similar to the previous version, consisted of different items and a greater number of items. Thus, it is possible that some of the variance in code of honor endorsement that was associated with exposure to neighborhood crime and violence in the previous study was instead absorbed by family neglect, conflict, and violence in the present study. In addition, the sex differences we found here that differ from those we reported in our earlier study could reflect, in part, a statistical limitation: Due to the properties of our dependent variables, which were counts, we could not conduct a proper multiple group comparison between sexes in the previous study (McCullough et al., 2013). Given that here we were able to more accurately conduct the analysis, and had a substantially larger sample size, we think the present results probably provide a better representation of the sex differences in code of honor endorsement—at least among undergraduate students at the private university at which the work was conducted. **AQ: 3**

A limitation of our findings related to the associations of childhood environmental characteristics with code of honor endorsement is that the data are correlational and cross-sectional, which limits confident causal inference. Future work with longitudinal designs can more rigorously test cause-and-effect relations of the childhood environmental characteristics that give rise to endorsement of the code of honor. Experimental designs that manipulate environments in ways theoretically relevant to code of honor concerns (e.g., manipulating the social status or resources of interacting subjects, or perhaps even taking subjects into high-crime neighborhoods; Nettle, Pepper, Jobling, & Schroeder, 2014) could prove useful as well. Future work conducted with different types of economic exchange paradigms could also be instrumental in evaluating the importance of the code of honor in different contexts (e.g., exchanges within groups vs. dyadic exchanges).

Furthermore, it is important to recognize that a substantial amount of the research conducted on the code of honor, including the current study, has used samples primarily consisting of college undergraduates (e.g., Cohen et al., 1996; McCullough et al., 2013). Obviously, this population does not represent the full spectrum of

socioeconomic backgrounds, affected age ranges, or other demographics that are relevant to code of honor research. Thus, the present results must be accompanied by the caveat that our sample, drawn from a private university, suffers from some range restriction on our childhood environment variables (exposure to family neglect, conflict, and violence; exposure to neighborhood crime and violence; perceived efficacy of neighborhood policing; and socioeconomic status). As a consequence, some of the associations between these variables and code of honor endorsement may in fact be underestimated, and it is possible that some of the sex differences are impacted by the range restriction as well. Future efforts to extend experimental code of honor research to populations outside of undergraduate samples would be beneficial for further illuminating its importance in human social interaction.

A successful program of research on the code of honor has emerged from a cultural-differences approach to studying behavior (Anderson, 1999; Black-Michaud, 1975; Nisbett & Cohen, 1996; Rodriguez Mosquera et al., 2000; Vandello et al., 2008). However, as we have suggested previously (McCullough et al., 2013) and here, this cultural-differences approach can be fruitfully complemented by a life history theoretical approach (Belsky, 2012; Belsky et al., 1991; Daly & Wilson, 2005; Hill et al., 2008; Kaplan & Gangestad, 2005). Moving forward, we think that using a combination of cultural differences and life history approaches, which seem to be consistent with the efforts of researchers endorsing a holistic "CuPS" (Culture × Person × Situation) approach (Leung & Cohen, 2011), will help to shed even more light on the social and environmental factors that lead to individual differences in the code of honor, both within and between cultures. Additionally, we believe that measuring both anger and envy separately, so that the two emotions can be distinguished, may provide unique insights into the psychological mechanisms of interest to those researchers who study the code of honor's emotional effects, as well as those researchers interested in anger and envy more generally.

References

Anderson, E. (1999). *Code of the street*. New York, NY: Norton and Company.

Aronson, E., Ellsworth, P. C., Carlsmith, J. M., & Gonzales, M. H. (1990). *Methods of research in social psychology*. New York, NY: McGraw-Hill.

Barnes, C. D., Brown, R. P., & Tamborski, M. (2012). Living dangerously culture of honor, risk-taking, and the nonrandomness of "accidental" deaths. *Social Psychological and Personality Science, 3,* 100–107. doi:10.1177/1948550611410440

Barratt, W. (2006). *The Barratt simplified measure of social status (BSMSS)*. Terre Haute, IN: Indiana State University.

Belsky, J. (2012). The development of human reproductive strategies progress and prospects. *Current Directions in Psychological Science, 21,* 310–316. doi:10.1177/0963721412453588

Belsky, J., Steinberg, L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development, 62,* 647–670. doi:10.2307/1131166

Berry, J. W., Worthington, E. L., O'Connor, L. E., Parrott, L., III, & Wade, N. G. (2005). Forgivingness, vengeful rumination, and affective traits. *Journal of Personality, 73,* 183–225. doi:10.1111/j.1467-6494.2004.00308.x

Black-Michaud, J. (1975). *Cohesive force: Feud in the Mediterranean and the Middle East*. Oxford, UK: Basil Blackwell.

Brezina, T., Agnew, R., Cullen, F. T., & Wright, J. P. (2004). The code of the street: A quantitative assessment of Elijah Anderson's subculture of violence thesis and its contribution to youth violence research. *Youth Violence and Juvenile Justice, 2,* 303–328.

Cohen, D., & Nisbett, R. E. (1994). Self-protection and the culture of honor: Explaining southern violence. *Personality and Social Psychology Bulletin, 20,* 551–567. doi:10.1177/0146167294205012

Cohen, D., Nisbett, R. E., Bowdle, B. F., & Schwarz, N. (1996). Insult, aggression, and the southern culture of honor: "An experimental ethnography". *Journal of Personality and Social Psychology, 70,* 945–960. doi:10.1037/0022-3514.70.5.945

Cohen, D., Vandello, J., Puente, S., & Rantilla, A. (1999). "When you call me that, smile!" How norms for politeness, interaction styles, and aggression work together in southern culture. *Social Psychology Quarterly, 62,* 257–275. doi:10.2307/2695863

Daly, M., & Wilson, M. (2005). Carpe diem: Adaptation and devaluing the future. *Quarterly Review of Biology, 80,* 55–60. doi:10.1086/431025

Eisenberger, R., Lynch, P., Aselage, J., & Rohdieck, S. (2004). Who takes the most revenge? Individual differences in negative reciprocity norm endorsement. *Personality and Social Psychology Bulletin, 30,* 787–799. doi:10.1177/0146167204264047

Ellis, B. J., Figueredo, A. J., Brumbach, B. H., & Schlomer, G. L. (2009). Fundamental dimensions of environmental risk. *Human Nature, 20,* 204–268. doi:10.1007/s12110-009-9063-7

Feather, N. T., & Sherman, R. (2002). Envy, resentment, schadenfreude, and sympathy: Reactions to deserved and undeserved achievement and subsequent failure. *Personality and Social Psychology Bulletin, 28,* 953–961. doi:10.1177/014616720202800708

Griskevicius, V., Tybur, J. M., Delton, A. W., & Robertson, T. E. (2011). The influence of mortality and socioeconomic status on risk and delayed rewards: A life history theory approach. *Journal of Personality and Social Psychology, 100,* 1015–1026. doi:10.1037/a0022403

Hareli, S., & Weiner, B. (2002). Dislike and envy as antecedents of pleasure at another's misfortune. *Motivation and Emotion, 26,* 257–277. doi:10.1023/A:1022818803399

Henry, P. J. (2009). Low-status compensation: A theory for understanding the role of status in cultures of honor. *Journal of Personality and Social Psychology, 97,* 451–466. doi:10.1037/a0015476

Hill, E. M., Jenkins, J., & Farmer, L. (2008). Family unpredictability, future discounting, and risk taking. *The Journal of Socio-Economics, 37,* 1381–1396. doi:10.1016/j.socec.2006.12.081

Hill, S. E., & Buss, D. M. (2006). Envy and positional bias in the evolutionary psychology of management. *Managerial and Decision Economics, 27,* 131–143.

Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Department of Psychology, Yale University, New Haven, CT.

IJzerman, H., van Dijk, W. W., & Gallucci, M. (2007). A bumpy train ride: A field experiment on insult, honor, and emotional reactions. *Emotion, 7,* 869–875. doi:10.1037/1528-3542.7.4.869

Kaplan, H. S., & Gangestad, S. W. (2005). Life history theory and evolutionary psychology. In D. M. Buss (Ed.), *Handbook of evolutionary psychology* (pp. 68–95). Hoboken, NJ: Wiley and Sons.

Kaplan, H., Hill, K., Lancaster, J., & Hurtado, A. M. (2000). A theory of human life history evolution: Diet, intelligence, and longevity. *Evolutionary Anthropology, 9,* 156–185. doi:10.1002/1520-6505(2000)9:4<156::AID-EVAN5>3.0.CO;2-7

Kubrin, C. E., & Weitzer, R. (2003). Retaliatory homicide: Concentrated disadvantage and neighborhood culture. *Social Problems, 50,* 157–180. doi:10.1525/sp.2003.50.2.157

Leach, C. W. (2008). Envy, inferiority, and injustice: Three bases of anger about inequality. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 94–116). New York, NY: Oxford University Press. doi:10.1093/acprof:oso/9780195327953.003.0006

Leung, A. K.-Y., & Cohen, D. (2011). Within-and between-culture variation: Individual differences and the cultural logics of honor, face, and dignity cultures. *Journal of Personality and Social Psychology, 100,* 507–526. doi:10.1037/a0022151

McCullough, M. E., Pedersen, E. J., Schroder, J. M., Tabak, B. A., & Carver, C. S. (2013). Harsh childhood environmental characteristics predict exploitation and retaliation in humans. *Proceedings of the Royal Society B: Biological Sciences, 280.*

Muthén, L. K., & Muthén, B. O. (1998–2010). *Mplus user's guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.

Nettle, D., Colle, A., & Cockerill, M. (2011). Variation in cooperative behaviour within a single city. *PLoS ONE, 6,* e26922. doi:10.1371/journal.pone.0026922

Nettle, D., Pepper, G. V., Jobling, R., & Schroeder, K. B. (2014). Being there: A brief visit to a neighbourhood induces the social attitudes of that neighbourhood. *PeerJ, 2,* e236. doi:10.7717/peerj.236

Nisbett, R. E., & Cohen, D. (1996). *Culture of honor: The psychology of violence in the South.* Boulder, CO: Westview.

Pedersen, E. J., Kurzban, R., & McCullough, M. E. (2013). Do humans really punish altruistically? A closer look. *Proceedings of the Royal Society B: Biological Sciences, 280.*

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42,* 185–227. doi:10.1080/00273170701341316

Rodriguez Mosquera, P. M., Fischer, A. H., Manstead, A. S. R., & Zaalberg, R. (2008). Attack, disapproval, or withdrawal? The role of honour in anger and shame responses to being insulted. *Cognition and Emotion, 22,* 1471–1498. doi:10.1080/02699930701822272

Rodriguez Mosquera, P. M., Manstead, A. S. R., & Fischer, A. H. (2000). The role of honor-related values in the elicitation, experience, and communication of pride, shame, and anger: Spain and the Netherlands compared. *Personality and Social Psychology Bulletin, 26,* 833–844. doi:10.1177/0146167200269008

Rodriguez Mosquera, P. M., Manstead, A. S. R., & Fischer, A. H. (2002). The role of honour concerns in emotional reactions to offences. *Cognition & Emotion, 16,* 143–163. doi:10.1080/02699930143000167

Sauer, P. L., & Dick, A. (1993). Using moderator variables in structural equation models. In L. McAlister & M. L. Rothschild (Eds.), *Advances in consumer research* (Vol. 20, pp. 637–640). Provo, UT: Association for Consumer Research.

Sell, A. N. (2011). The recalibrational theory and violent anger. *Aggression and Violent Behavior, 16,* 381–389. doi:10.1016/j.avb.2011.04.013

Smith, R. H., & Kim, S. H. (2007). Comprehending envy. *Psychological Bulletin, 133,* 46–64. doi:10.1037/0033-2909.133.1.46

Stewart, E. A., Schreck, C. J., & Simons, R. L. (2006). "I ain't gonna let no one disrespect me:" Does the code of the street reduce or increase violent victimization among African American adolescents? *Journal of Research in Crime and Delinquency, 43,* 427–458. doi:10.1177/0022427806292338

Taylor, S. E., Lerner, J. S., Sage, R. M., Lehman, B. J., & Seeman, T. E. (2004). Early environment, emotions, responses to stress, and health. *Journal of Personality, 72,* 1365–1393. doi:10.1111/j.1467-6494.2004.00300.x

Tooby, J., & Cosmides, L. (1990). On the universality of human nature and the uniqueness of the individual: The role of genetics and adaptation. *Journal of Personality, 58,* 17–67. doi:10.1111/j.1467-6494.1990.tb00907.x

Tyler, T. R. (2005). Policing in black and white: Ethnic group differences in trust and confidence in the police. *Police Quarterly, 8,* 322–342. doi:10.1177/1098611104271105

Vandello, J. A., Cohen, D., & Ransom, S. (2008). U.S. southern and northern differences in perceptions of norms about aggression mechanisms for the perpetuation of a culture of honor. *Journal of Cross-Cultural Psychology, 39,* 162–177. doi:10.1177/0022022107313862

Wilson, M., & Daly, M. (1997). Life expectancy, economic inequality, homicide, and reproductive timing in Chicago neighbourhoods. *British Medical Journal, 314,* 1271–1274. doi:10.1136/bmj.314.7089.1271