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The emotion–valuation constellation: Multiple emotions are governed by a common grammar of social valuation

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Abstract

Social emotions are hypothesized to be adaptations designed by selection to solve adaptive problems pertaining to *social valuation*—the disposition to attend to, associate with, and aid a target individual based on her probable contributions to the fitness of the valuer. To steer between effectiveness and economy, social emotions need to activate in precise proportion to the local evaluations of the various acts and characteristics that dictate the social value of self and others. Supporting this hypothesis, experiments conducted in the United States and India indicate that five different social emotions all track a common set of valuations. The extent to which people value each of 25 positive characteristics in others predicts the intensities of: pride (if you had those characteristics), anger (if someone failed to acknowledge that you have those characteristics), gratitude (if someone convinced others that you have those characteristics), guilt (if you harmed someone who has those characteristics), and sadness (if someone died who had those characteristics). The five emotions track local valuations (mean r = +.72) and even foreign valuations (mean r = +.70). In addition, cultural differences in emotion are patterned: They follow cultural differences in valuation. These findings suggest that multiple social emotions are governed (in part) by a common architecture of social valuation, that the valuation architecture operates with a substantial degree of universality in its content, and that a unified theoretical framework may explain cross-cultural invariances and cultural differences in emotion.

Keywords: Emotion, Motivation, Social Valuation, Welfare Tradeoffs, Evolutionary Psychology, Culture, Pride, Anger, Gratitude, Guilt, Sadness, Shame

Introduction

Over the last half-century, evolutionarily-oriented theorists have developed theories of how a number of different adaptive problems favored the evolution of psychological mechanisms that place weight on the welfare of others and that, within limits, sacrifice self for others. These theories include: kin selection (Hamilton, 1964), reciprocation (Trivers, 1971), partner choice (Noë & Hammerstein, 1994), reputation (Nowak & Sigmund, 1998), risk-pooling (Kaplan & Hill, 1985), externality management (Tooby & Cosmides, 1996), and (substituting deference for valuation) aggressive contests (Hammerstein & Parker, 1982). These theories led to the empirical discovery of an array of neurocognitive architectures for computing the *social value* of a target individual to a valuer, which takes into account: (*i*) the target's probable contribution of fitness benefits to the valuer as, e.g., kin, mate, trading partner, and fellow coalition member, and (*ii*) the target's probable imposition of fitness costs on the valuer, if not propitiated (Gilbert, 1997; Barclay & Willer, 2007; Cacioppo, Gardner, & Berntson, 1999; Cuddy, Fiske, & Glick, 2008; Lieberman, Tooby, & Cosmides, 2007; Sznycer, De Smet, Billingsley, & Lieberman, 2016; Lukaszewski, Simmons, Anderson, & Roney, 2015; Sell, Tooby, & Cosmides, 2009; Sznycer, Delton, Robertson, Cosmides, & Tooby, 2019; see Levy & Glimcher, 2012; Klein, Deaner, & Platt, 2008; Hare, Camerer, Knoepfle, O'Doherty, & Rangel, 2010). Based on a target's social value to a valuer, the valuer will (or will not) be disposed to trade her welfare in favor of the target's welfare by, e.g., aiding the target or refraining from benefitting at the target's expense (Tooby, Cosmides, Sell, Lieberman, & Sznycer, 2008).

Novel challenges and opportunities arose for ancestral humans with the appearance of conspecifics who were intrinsically valuable to the individual and who could conditionally value or disvalue the individual based on the individual's actions and characteristics. For example,

indications that another individual now places more weight on your welfare than she used to are auspicious, because the other will thence take more actions that benefit you but cost her, and fewer actions that benefit her but cost you. The other has a stake in your well-being, and so you have a stake in the other's well-being (Tooby & Cosmides, 1996; Roberts, 2005; Aktipis et al., 2018). Thus, indications of being valued more highly than previously have the effect of raising the other's social value to you, with corresponding increases in your valuation of the other and your disposition to aid the other (Smith, Pedersen, Forster, McCullough, & Lieberman, 2017; for exceptions to this, see Ackerman & Kenrick, 2008).

Ancestral humans faced many other adaptive problems of social valuation besides the increase in the social value of others to the self. These include: (*i*) the decrease in the social value of others to the self; (*ii*) changes, positive and negative, in the value of the self to others; (*iii*) mismatches between the valuations presently assigned by self or others and the equilibrium valuations that are most efficient (or prudent) to assign based on self and others' relative ability and willingness to deliver benefits or inflict costs; and (*iv*) the loss of valuable others. These adaptive problems would have crafted programs that carry out the requisite computations to govern behavior in a manner that promoted survival and reproduction in ancestral environments.

It has been hypothesized that emotions are neurocognitive adaptations designed by natural selection to orchestrate cognition and behavior in the service of solving complex adaptive problems, and that social emotions are a subset of emotions designed to solve adaptive problems of sociality (Tooby, 1985; Tooby & Cosmides, 1990; Nesse, 1990; Ekman, 1992; Keltner & Haidt, 1999; Darwin, 1872). Recalibration appears to be a central aspect of social emotions: These emotions recalibrate internal variables of the cognitive architecture, including, notably, variables that index the social valuations assigned by self and others (Tooby & Cosmides, 2008;

Sell et al., 2009; Sznycer, Cosmides, & Tooby, 2017; Sznycer, Lopez Seal, et al., 2017; Delton & Robertson, 2016; Al-Shawaf, Conroy-Beam, Asao, & Buss, 2016; Al-Shawaf & Lewis, 2017). From this theoretical perspective, different social emotions are different adaptations that evolved to solve different adaptive problems of social valuation and that have different elicitors and outputs[1]. For example:

- The gratitude system appears designed to consolidate a higher level of cooperation with a social partner (Algoe, Haidt, & Gable, 2008; Lim, 2012; Smith et al., 2017). Gratitude is triggered by indications that another places an unexpectedly high weight on the individual's welfare (Algoe et al., 2008; Lim, 2012; Smith et al., 2017; Tesser, Gatewood, & Driver, 1968; Tsang, 2006a, 2006b). Once activated, gratitude increases the weight the individual attaches to the other's welfare (Gordon, Impett, Kogan, Oveis, & Keltner, 2012; Lim, 2012; Smith et al., 2017), which can lead to a cycle of escalating, mutual valuation (Algoe, Fredrickson, & Gable, 2013; Algoe et al., 2008; Tooby & Cosmides, 1996).
- The pride system is designed to motivate the achievement and advertisement of socially valued acts or traits so that others place more weight on the individual's welfare (Fessler, 1999; Weisfeld, 1999; Tracy, Shariff, & Cheng, 2010; Sznycer, Al-Shawaf, et al., 2017). Pride is triggered in response to achievements—events indicating the individual has an enhanced capacity to deliver benefits or impose costs on others (Lewis, Alessandri, & Sullivan, 1992; Tracy & Matsumoto, 2008). When triggered, the pride system advertises one's achievements, motivates continued investment in the courses of action that bring

[1] For alternative views of emotion, see, e.g., Barrett & Russell (2014).

about achievement, and demands enhanced valuation from others (Riskind & Gotay, 1982; Tracy & Robins, 2008; Weisfeld, 1999; Williams & DeSteno, 2008; see Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013).

- Anger functions to bargain for better treatment (Sell et al., 2017). Anger triggers in response to indications that another places insufficient weight on the welfare of the individual—less weight than the individual feels entitled to (Sell et al., 2009, 2017). Once triggered, the anger system deploys various tactics to incentivize the other to increase her valuation of the individual: communication of the anger state (Galati, Sini, Schmidt, & Tinti, 2003; Sell, Cosmides, & Tooby, 2014), arguments (Averill, 1982; Sell et al., 2017), and threats of (or actual) withdrawal of assistance or imposition of costs (Daly & Wilson, 1988; Felson, 1982; Sell, 2011).
- Guilt appears designed to remedy situations where one put insufficient weight on the welfare of a valuable other (often unintentionally), independent of whether the other knows this (Baumeister, Stillwell, & Heatherton, 1994; Leith & Baumeister, 1998; Smith, Webster, & Eyre, 2002; McGraw, 1987; Tooby & Cosmides, 2008; Sznycer, 2010, 2019). Once triggered, the guilt system increases the weight the individual attaches to the other's welfare: It interrupts the imposition of costs (Cohen, Panter, & Turan, 2013; Cohen, Panter, Turan, Morse, & Kim, 2014) and motivates actions to benefit the victim and repair the relationship, including: restitutions, amends, apologies, confessions, and acceptance of responsibility (Baumeister, Stillwell, & Heatherton, 1995; Tangney, 1991; de Hooge, Zeelenberg, & Breugelmans, 2007; Ketelaar & Au, 2003; Leith & Baumeister, 1998; Ohtsubo & Yagi, 2015; Sznycer, Schniter, Tooby, & Cosmides, 2015).

- Sadness is activated by the separation, incapacitation, or death of associates who may otherwise value the individual's welfare and make positive fitness contributions to her (Tooby & Cosmides, 1990; Keller & Nesse, 2006; see also Hagen, 1999; Hagen & Barrett, 2007). When activated, sadness reduces the motivation to move and to act (Michalak et al., 2009), a response that can prevent behaviors causing further loss (Keller & Nesse, 2006; Welling, 2003). Also, sadness prompts cognitive activity geared to solve problems related to the loss or to adapt to the loss (Andrews & Thomson, 2009).
- Shame functions to minimize the spread of negative information about the self and the cost of any ensuing devaluation (Gilbert, 1997; Fessler, 1999; Weisfeld & Dillon, 2012; Sznycer et al., 2016). Shame is triggered by indications of probable or actual devaluation (Smith, Webster, & Eyre, 2002; Dickerson, Mycek, & Zaldivar, 2008; Robertson, Sznycer, Delton, Tooby, & Cosmides, 2018). Shame motivates the individual to inhibit actions that may cause others to devalue her (de Hooge, Breugelmans, & Zeelenberg, 2008; Fehr & Gächter, 2000), to conceal incriminating information (Leach & Cidam, 2015; Sznycer, Schniter, Tooby, & Cosmides, 2015), and to withdraw from the situation (Wicker, Payne, & Morgan, 1983). When ashamed, the individual appeases (Keltner, Young, & Buswell, 1997) and produces a stereotyped nonverbal display that deters attacks by signaling subordination (Keltner et al., 1997; Fessler, 1999; Gilbert, 2000; Tracy & Matsumoto, 2008; Weisfeld & Dillon, 2012).

Gratitude, pride, anger, guilt, sadness, and shame appear to be different emotion programs, each selected for by different adaptive problems, and each with different functions, input conditions, information-processing procedures, core-affective properties (Nelson & Russell,

2014; Russell, 1980), physiological signatures (Blascovich & Mendes, 2010; Siegel et al., 2018), and behavioral repertoires. Nevertheless, if those emotions are to mobilize in a cost-effective fashion, they all need accurate estimates of the degree to which the underlying acts, traits, and circumstances that trigger them are valued or disvalued in one's local ecology. It has been hypothesized that the human mind–brain features a generative grammar with universal principles and open parameters that computes the social value of an individual based on her actions (e.g., shares food), traits (e.g., physically formidable), and characteristics (e.g., sibling of chief), and that social emotions consult relevant social values to modulate their operation (Jackendoff, 2006; Tooby & Cosmides, 2008; Sznycer, Al-Shawaf, et al., 2017; Sznycer, 2019; see also references above).

A prediction follows from this hypothesis: If an individual in a given social ecology is positively (or negatively) evaluated when she performs act *x* (or displays trait *x*), then *x* may participate in the elicitation of multiple, different social emotions. For example, if people value *trustworthiness* in others (i.e., if the grammar of valuation attaches a positive weight to the welfare of those who display trustworthiness), then pride may be triggered when, e.g., one is trustworthy; anger may be triggered when, e.g., one is trustworthy and others fail to acknowledge it, behaving as if one were not so; gratitude may be triggered when, e.g., a friend convinces third parties that one is trustworthy—because those situations meet the input conditions of those emotions (see above; see also Gervais & Fessler, 2017).

A given act or trait displayed by self or others may elicit different emotions depending on which role that act or trait plays in conceptual structure. For example, *trustworthiness* may be part of TRIGGER OF ANGER (as in, e.g., [fails to acknowledge that [I am trustworthy]]) or TRIGGER OF GRATITUDE (as in, e.g., [convinces others that [I am trustworthy]]). Further, a given act or trait

displayed by self or others may participate in different emotion-specific computations and generate different emotion-specific outputs. However, the local value attached to the underlying act or trait will be, as a first approximation, *the same*, regardless of which social emotion is currently accessing that value. Therefore, it is further predicted that there will be a correspondence between (*i*) the difference in value the grammar of valuation attaches to two (or *n*) different acts or traits, and (*ii*) the difference in the intensity of emotion that those acts or traits elicit as constituents of triggers of emotions. Moreover, and critically, the valuation–emotion correspondence will obtain for each of multiple, different emotions. For example, if trustworthiness is more highly valued than marksmanship in a given social ecology, then, everything else being equal, the intensity of anger will be higher when, e.g., someone fails to acknowledge one's trustworthiness than when someone fails to acknowledge one's good marksmanship; the intensity of gratitude will be higher when, e.g., someone convinces others that one is trustworthy than when someone convinces others that one has good marksmanship; and so forth.

If social emotions are well-engineered adaptations, they should estimate and track the valuations held by members of one's local social ecology. This would prevent two types of errors in the operation of these emotions. One possible error occurs when social emotions under-activate relative to local valuations. This would result in ineffectiveness. For example, the under-activation of pride would lead to the insufficient pursuit and advertisement of socially valued acts, and thus to only a fraction of the increase in others' valuations of the self that is achievable cost-effectively. The under-activation of anger would insufficiently incentivize the target of the anger to upwardly recalibrate her valuation of the self, and thus also would yield a fraction of the

benefits that are achievable cost-effectively. The under-activation of gratitude would cut down opportunities to cement a cooperative relationship with a well-disposed social partner.

If emotion under-activation is a costly error, so is emotion over-activation. This would lead to diminishing or even negative returns. For example, the over-activation of pride would lead to the over-pursuit and over-advertisement of socially valued courses of action—something which audiences might resist and devalue (Anderson, Ames, & Gosling, 2008; Greenaway & Kalokerinos, 2017; Schlenker & Leary, 1982). The over-activation of gratitude could lead to excessive investments in a social partner; it also may have the paradoxical effect of eliciting devaluation from others, because it may imply that one's social worth is lower than it actually is (see Tiedens, Ellsworth, & Mesquita, 2000).

To steer between effectiveness and economy, social emotions need to consult the grammar of valuation to estimate the value the relevant act or trait affords to local audiences, and modulate their activation in proportion to that value[2]. Moreover, because one of the key functions of emotions is to evaluate alternative future courses of action (Bechara, Damasio, & Damasio, 2000; Schwarz, 2000; Sznycer et al., 2016), the close tracking of act/trait valuations by emotions should occur even in the absence of any communication between the audience, which collectively dictates the values of acts and traits, and the individual guiding her choices based on anticipated emotion. Decisions about actions must often be made in advance of observing feedback about one's actions, and so the social emotions would be handicapped if they needed to compute local values by first observing others' reactions to one's acts and traits instead of estimating those magnitudes in advance. That is, social emotions are expected to mobilize not

[2] We note that deviations from proportionality can occur due to such factors as error and opportunism (e.g., Johnson & Fowler, 2011).

only reactively, in response to actual events, but also anticipatorily and prospectively (Van Der Schalk, Bruder, & Manstead, 2012). Thus, it is a theoretically-derived prediction that the anticipated or imagined intensity of social emotions will accurately and precisely track the values afforded to audiences by the relevant acts and traits.

The preceding argument has various entailments. If the grammar of valuation and allied emotion systems are evolved, human-universal adaptations, then the predicted associations between social valuation and the intensities of multiple emotions should be observable across populations. What's more, audience valuations in a given population may predict emotions in another population. The social emotions evolved for making decisions among, recalibrating with respect to, and tracking the values of those who can impact one's welfare—one's local group. Indeed, some actions, traits, and situations elicit evaluative responses and emotions in some populations but not others (Haidt, 2012; von Fürer-Haimendorf, 1967; Sznycer et al., 2016)—expected when open parameters of the valuation grammar are filled in with different local information. However, if the valuation grammar features universal principles besides open parameters, then actions, traits, and situations that tap these principles may elicit agreement across populations about social valuation and emotions, and, moreover, multiple emotions in a given population may all track the valuations that people hold in other, foreign populations.

Existing data support some of these predictions. For example, the intensity of anticipated pride regarding a given socially valued act or trait precisely tracks the degree to which audiences value those individuals who perform that act or display that trait (Sznycer, Al-Shawaf, et al., 2017; see also Leary, Tambor, Terdal, & Downs, 1995). This result replicated in 16 industrial countries in four continents. Further, consistent with the hypothesis that the valuation grammar is equipped with invariant, species-typical principles, pride in each of the 16 countries tracked the

valuations expressed by foreign audiences in each of the other 15 countries (Sznycer, Al-Shawaf, et al., 2017). More recently, close associations between pride and the valuations expressed by audiences were observed in 10 traditional small-scale societies around the world (Sznycer, Xygalatas, Alami, et al., 2018), suggesting that the match between pride and the evaluative psychology of audiences stems from pan-human adaptations designed by selection. Importantly, the valuations expressed by audiences are tracked specifically by pride. Other positively-valenced emotions do not uniquely track audience valuations, even when those other emotions co-activate with pride (Sznycer, Al-Shawaf, et al., 2017).

In other sets of studies, shame tracked the devaluation that audiences expressed with respect to various disgraceful acts and traits (Sznycer et al., 2016; Sznycer, Xygalatas, Agey, et al., 2018; Cohen, Chun, & Sznycer, forthcoming). Meanwhile, other negatively-valenced emotions failed to uniquely track audience devaluation (Sznycer et al., 2016).

Although the pride and shame studies are suggestive, these studies used different acts and traits as stimuli. Thus, while there is evidence of a pride–valuation link and a shame–devaluation link, it is not yet known whether the valuations afforded by one and the same set of acts and traits predict the intensities of each of multiple emotions, as the theory predicts (but see Durkee, Lukaszewski, & Buss, forthcoming, for evidence that pride and shame track a common set of acts and traits). Further, pride and shame are reputation-management emotions—a particular subset of social emotions. Thus, it is an open question whether the valuation–emotion links generalize to other social emotions not specifically designed to manage one's reputation.

The present experiment

The present experiment focuses on five social emotions: pride, anger, gratitude, sadness, and guilt. This selection allows tests of the match-to-valuation hypothesis across many, functionally distinct social emotions: Some of those emotions are positively-valenced while others are negatively-valenced; some of those emotions are arousing while others are not (Mauro, Sato, & Tucker, 1992; Russell & Barrett, 1999); some of those emotions function to manage the individual's reputation while others do not. These emotions vary along other dimensions as well (Fontaine, Scherer, Roesch, & Ellsworth, 2007; Scherer & Wallbott, 1994; Smith & Ellsworth, 1985). Furthermore, and critically, a single set of acts and traits is used as stimuli to elicit each emotion.

The present experimental design can answer the following questions: Is there a lawful association between local audiences' social valuations of specific acts and traits and the activation of multiple social emotions? And, if so, is the valuation–emotion constellation observed in multiple cultures? And, does the magnitude of audience valuation in one culture predict the intensity of multiple emotions in another culture?

Additionally, the present experimental design can answer the question: Are cultural differences in emotion arbitrary, or are they patterned? If emotion is a function of valuation, then cultural differences in emotions may be a function of cultural differences in valuation. More specifically, the more an act or trait is valued in culture *A* compared to culture *B*, the more we expect that act or trait to participate in the elicitation of multiple emotions in culture *A* compared to culture *B*.

Method

Participants and procedure

We collected data with Amazon Mechanical Turk from 242 participants (133 females) in the United States (age: M = 36, SD = 12) and 188 participants (61 females) in India (age: M = 32, SD = 9). Fifteen Indian participants were excluded from analyses due to failure to pass an attention check, leaving an effective sample of 173 participants (55 females) (age: M = 32, SD = 9). Inclusion of the inattentive Indian participants does not change the pattern of results.

The stimuli consist of 25 brief hypothetical scenarios, developed by Sznycer, Al-Shawaf, et al. (2017), in which someone's acts, traits, or circumstances might lead them to be viewed positively. The scenarios were designed to elicit reactions in a wide variety of evolutionarily relevant domains, such as social exchange, skills, aggressive contests, mating, parenting, and leadership, and were phrased at a relatively high level of abstraction (e.g., "You have many unique skills", rather than, e.g., "You know how to play the piano and how to pilot airplanes").

Participants were randomly assigned to one of six between-subjects conditions: one *valuation* condition, and five emotion conditions: *guilt*, *sadness*, *pride*, *anger*, and *gratitude*. (Shame was not assessed in this experiment). In all six conditions participants rated the same basic set of 25 scenarios. The main difference across conditions—the experimental manipulation—was a prompt, displayed immediately before the scenarios, instructing participants to interpret the scenarios in a way that would elicit either valuation of a target individual or one of the five emotions.

In the valuation condition, the prompt asked participants to imagine that the acts and traits described in the 25 scenarios (e.g., "She is trustworthy," "She has many unique skills," "She is physically attractive") are true of a target individual: an individual other than the participant who is of the same sex and age as the participant. Then, participants were asked to "indicate [for each scenario] how you would view this person," with scales ranging from 1–7 (I wouldn't view them

positively at all – I'd view them very positively). These ratings provide situation-specific measures of the degree to which members of a given population would value the individual described in the scenarios.

In the guilt condition, the prompt asked participants to imagine that they backed into someone's car and dented it, and further, that there wasn't any evidence that they dented the other's car: No one saw them, and their own car remained intact. They left the scene without leaving their insurance information, which would have helped the target pay for the repair but at the cost of an increased premium for themselves. Subsequently, participants learn that the car they dented belongs to a neighbor. Participants were then asked to indicate, for each of the 25 scenarios, "how much guilt you would feel if you then learn that several positive things are true of your neighbor", with scales ranging from 1–7 (no guilt at all [– a lot of guilt] if this is true of the woman [man] whose car I dented).

In the sadness condition, the prompt asked participants to imagine that a neighbor—a person they knew little about—had died recently. They indicated "how much sadness you would feel if you find out that several positive things were true of that woman [man]" (e.g., "She was trustworthy," "She had many unique skills," "She was physically attractive"), with scales ranging from 1–7 (no sadness at all [– a lot of sadness] if this was true of the deceased woman [man]).

In the pride condition, the prompt asked participants to imagine that the acts and traits described in the 25 scenarios are true of themselves (e.g., "You are trustworthy," "You have many unique skills," "You are physically attractive"), and to "indicate how much pride you would feel if you were in those situations", with scales ranging from 1–7 (no pride at all – a lot of pride).

In the anger condition, the prompt asked participants to imagine that positive things are true of themselves but their friend fails to properly acknowledge those things. Participants were asked to "indicate how much anger you would feel if your friend fails to properly acknowledge those [things]," with scales ranging from 1–7 (no anger at all [– a lot of anger] if my friend fails to properly acknowledge that this is true of me).

In the gratitude condition, the prompt asked participants to imagine that by spreading information favorable to the participant a good friend convinces third parties that positive things are true of the participant, even though that information is not exactly accurate. Participants indicated "how much gratitude you would feel toward your friend for convincing others [about that]," with scales ranging from 1–7 (no gratitude at all [– a lot of gratitude] if my friend convinces others that this is true of me).

In sum, participants rated, for each of 25 scenarios describing positive acts and traits, their: (*i*) valuation of another individual, if those things were true of that individual; (*ii*) guilt, if those things were true of another individual on whom the participant has imposed costs—in the absence of any incriminating evidence that might point the other individual or third parties to the participant; (*iii*) sadness, if those things were true of a recently deceased neighbor; (*iv*) pride, if those things were true of themselves; (*v*) anger, if a friend failed to acknowledge those things about them; or (*vi*) gratitude, if a friend convinced others that those things are true of the participant. Each participant rated only one of the six sets of 25 items.

The scenarios were presented in randomized order within conditions. The stimuli were presented in English in the United States and India. Full text of the condition prompts and scenarios used in the United States and India are provided in the Appendix, Tables S1, S2 & S3.

Results

Within-Country Results. First, we report the results for each country. Descriptive statistics are provided in Tables S2 & S3.

Valuation: Do participants within countries agree on how positively they would view the target individual in each of these scenarios? Yes. To measure agreement among raters on how socially valuable the 25 acts and traits are relative to one another, we computed intra-class correlations (ICC) in each country. There was widespread agreement about how socially valuable these acts and traits are relative to one another: United States: ICC (2,39) = .97; India: ICC (2,30) = .87.

Emotions: Do participants within countries agree on the degree to which they would feel an emotion if they found themselves in one of the five emotion-eliciting situations? Yes. There was widespread agreement about the relative intensity of emotion the 25 situations would elicit. United States: pride: ICC (2,40) = .93; anger: ICC (2,41) = .90; gratitude: ICC (2,40) = .96; sadness: ICC (2,43) = .97; guilt: ICC (2,39) = .91. India: pride: ICC (2,25) = .82; anger: ICC (2,29) = .60; gratitude: ICC (2,29) = .75; sadness: ICC (2,32) = .83; guilt: ICC (2,28) = .54.

Does valuation predict the intensities of the five emotions within countries? Yes. The magnitude of social valuation afforded by the 25 positive characteristics correlates positively with the intensities of: pride (if those characteristics were true of you), anger (if a friend failed to acknowledge those characteristics in you), gratitude (if a friend convinced third parties that those characteristics are true of you), sadness (if those characteristics were true of a deceased neighbor), and guilt (if those characteristics were true of someone on whom you have imposed costs). For each of the 25 scenarios, we calculated the mean ratings of each of the five emotions provided by participants in the emotion conditions, and the mean valuation ratings provided by

participants in the valuation condition. In the United States, for a given scenario, ratings of valuation predicted the intensities of the five emotions: pride, anger, gratitude, sadness, and guilt (rs = .62–.81, ps = 10^{-6}–.0009). In India, too, for a given scenario, ratings of valuation predicted the intensities of the five emotions (rs = .37–.87, ps = 10^{-7}–.069) (see Figs. 1, 2 [panels A, B], and Table 1). Moreover, the emotion–valuation associations all held in mixed models predicting ratings of each emotion from ratings of valuation across the 25 scenarios. In these mixed models, the intercept and slope of emotion ratings were modeled as fixed effects while the participant-level emotion intercept was modeled as a random effect (see Table 2 for model statistics). As such, it is unlikely that the observed associations between emotions and valuation are driven by participant-level error (Judd, Westfall, & Kenny, 2012).

Further, the intensities of the five emotions were intercorrelated, both in the United States (rs = .62–.90, ps = 10^{-9}–.0009) and in India (rs = .34–.84, ps = 10^{-6}–.09) (see Table 1). Recall that the ratings of valuation, pride, anger, gratitude, sadness, and guilt originated from different participants. Consequently, these correlations cannot be attributed to participants matching their valuation and emotion ratings.

Insert Figure 1 about here

Insert Table 1 about here

Insert Table 2 about here

Between-Country Results. To test for between-country agreement in valuation, in emotions, and in the valuation–emotion links, we computed the extent to which the mean valuation ratings and the mean emotion ratings are correlated across countries.

Valuation: Do American and Indian participants agree on how positively they would view the target individual in each of these scenarios? Yes. There was between-country agreement on the degree to which a given act or trait would elicit valuation: $r = .95$, $p = 10^{-12}$. The more American participants valued a target individual for taking a given act or displaying a given trait, the more Indian participants valued a target individual for taking that act or displaying that trait. The ordinal cross-country agreement in social valuation was extraordinarily high.

Emotions: Do American and Indian participants agree on the intensity with which they would feel an emotion if they found themselves in one of the five emotion-eliciting situations? Yes. American and Indian participants agreed about the relative extent to which a given characteristic would elicit pride (if that characteristic is true of them; $r = .84$, $p = 10^{-6}$), anger (if a friend failed to acknowledge that characteristic in them; $r = .64$, $p = .0006$), gratitude (if a friend convinced third parties that that characteristic is true of the participant; $r = .88$, $p = 10^{-8}$), sadness (if that characteristic was true of a deceased neighbor; $r = .91$, $p = 10^{-9}$), and guilt (if that characteristic is true of someone on whom they have imposed costs; $r = .84$, $p = 10^{-6}$).

Does magnitude of valuation in one country predict intensities of emotions in the other country? Yes. Valuation in each country predicted each of the five emotions in the other country. American participants' ratings of valuation were correlated with Indian participants' ratings of

pride, anger, gratitude, sadness, and guilt (*r*s = .42–.90, *p*s = 10^{-9}–.04). Likewise, Indian participants' ratings of valuation were correlated with American participants' ratings of pride, anger, gratitude, sadness, and guilt (*r*s = .53–.76, *p*s = 10^{-4}–.007) (see Fig. 2 [panels C, D], and Table 1). Further, each of the five emotions in each country was correlated with each of the other four emotions in the other country (*r*s = .35–.90, *p*s = 10^{-8}–.09; Table 1). As was the case for the within-country results, these between-country associations held whether computed as zero-order correlations (Table 1) or in mixed models (Table 2). To put some of this more vividly: One can accurately predict the intensities of Indians' sadness from Americans' social valuations, and the intensities of Americans' anger from the intensities of Indians' pride.

Do the results actually reflect five different social emotions tracking social valuations? The present experiment was not designed to assess the degree of specificity with which the five emotions track the valuation of audiences. However, we note that emotion ratings in almost all cases correlated more highly with same-emotion ratings across countries than with different-emotion ratings either within or across countries (see Table 1). Evidence of specificity becomes even more pronounced when holding constant valuation—which, as predicted, is moderately-to-strongly correlated with all emotions. Table S4 presents the results of partial correlations among country-specific emotion ratings across the 25 scenario items, while controlling for valuation ratings. When controlling for valuation ratings from both the US and India, the same-emotion partial correlations across countries were descriptively much larger than nearly all of the different-emotion partial correlations. This was true for anger–anger (*partial r* =.52, $p < .01$), gratitude–gratitude (*partial r* = .72, $p < .001$), guilt–guilt (*partial r* = .77, $p < .001$), pride–pride (*partial r* = .53, $p < .01$), and sadness–sadness (*partial r* = .68, $p < .001$). Low statistical power at the scenario level prevents us from testing inferentially whether the same-emotion correlations

are larger than the relevant different-emotion correlations. However, we note that the average same-emotion partial correlation effect size was +.64, whereas the average different-emotion partial correlation effect size was +.18. Patterns were very similar when controlling for either US valuation ratings or India valuation ratings (see Table S4).

Are there cultural differences in emotions? And if so, are cultural differences in emotions patterned? Yes, and yes. Ratings of valuation and emotions tended to be higher in India than in the United States (Table S5). Importantly, cultural differences in emotions were systematically correlated with cultural differences in audience valuation. For each scenario, and for each of the six measures (valuation, pride, anger, gratitude, sadness, and guilt), we subtracted the mean ratings provided by American participants from the mean ratings provided by Indian participants. This resulted in 25 difference scores—one for each of the 25 scenarios—for each of the six measures. As predicted if cultural differences in emotion stem from cultural differences in valuation, difference scores of valuation were positively correlated with difference scores of pride (r = .53, p = .006), difference scores of anger (r = .54, p = .005), difference scores of gratitude (r = .74, p = .00002), difference scores of sadness (r = .59, p = .002), and difference scores of guilt (r = .79, p = .000003). The more an act or trait was socially valued by Indian participants relative to American participants, the more that act or trait participated in the elicitation of pride, anger, gratitude, sadness, and guilt among Indian participants relative to American participants.

Insert Figure 2 about here

Discussion

The present research adds to a growing number of findings supporting the claim that social evaluations underlie the operation of multiple, different social emotions (Sznycer et al., 2016; Sznycer, Al-Shawaf, et al., 2017; Sznycer, Xygalatas, Agey, et al., 2018; Sznycer, Xygalatas, Alami, et al., 2018; Durkee et al., forthcoming; Cohen et al., forthcoming; Lieberman, Tooby, & Cosmides, 2007; Lim, 2012; Smith et al., 2017). The present research also indicates cross-cultural regularities in the structure and content of human social-evaluative psychology, as found in past research (Buss, 1989; Buss et al., 1990; Shackelford, Schmitt, & Buss, 2005; Fiske, Cuddy, & Glick, 2007; Evans & Scott, 1984; Brown, 1991; Rozin, Lowery, & Haidt, 1999; Henrich et al., 2006; Herrmann, Thöni, & Gächter, 2008; Sznycer et al., 2016; Sznycer, Al-Shawaf, et al., 2017; Sznycer, Xygalatas, Agey, et al., 2018; Sznycer, Xygalatas, Alami, et al., 2018; Curry, Mullins, & Whitehouse, 2019; Durkee et al., forthcoming). Against this background, this work is to our knowledge the first to document a quantitatively close correspondence between social evaluations and the intensities with which multiple social emotions are activated.

The degree to which local audiences positively value a target individual if various acts, traits, or circumstances are true of that individual predicts the degree to which people feel each of five different social emotions. This result replicates in the United States and India, two countries with seemingly disparate cultures. Moreover, audience valuations in each country predict the intensities of each of the five emotions in the other country. This suggests that multiple social emotions are governed, in part, by a common, human-universal grammar of social valuation. Importantly, the emotion–valuation link is not confined to the reputation-

management emotions of pride and shame, as was observed in past research (Sznycer et al., 2016; Sznycer, Al-Shawaf, et al., 2017; Sznycer, Xygalatas, Agey, et al., 2018; Sznycer, Xygalatas, Alami, et al., 2018; Durkee et al., forthcoming; Cohen et al., forthcoming). Instead, this link generalizes across a broad suite of social emotions. Indeed, similar emotion–valuation links are observed across emotions that appear to have highly different functions, computational properties, and phenomenologies. To see the breadth of this effect, consider pride and sadness. These emotions are approximately opposite each other in the two-dimensional bipolar core-affective space defined by valence and arousal (Nelson & Russell, 2014; Russell, 1980). And yet, despite these and other important differences between those two emotions, one and the same set of act/trait valuations accounts for 65–76% of the variance in same-country ratings, and 50–82% of the variance in cross-country ratings, of both pride and sadness. This degree of coherence across different situations, different emotions, and different cultures is striking. Yet, this coherence is expected if (*i*) multiple social emotions modulate their activation in proportion to the social value of self and others, in order to steer optimally between efficiency and economy, and (*ii*) universal, species-typical principles underlie the computation of social values.

The present theoretical framework can explain not only within- and between-culture regularities in emotion; this framework can also begin to explain cultural differences in emotion (Sznycer et al., 2012; Sznycer et al., 2016, Study S2; Sznycer, Al-Shawaf, et al., 2017, Study S1; see also Mesquita & Frijda, 1992; Scherer & Wallbott, 1994; Elfenbein & Ambady, 2002). Cultural differences in social emotions are expected to follow cultural differences in social valuation: The more an act or trait is socially valued in culture *A* compared to culture *B*, the more that act or trait is expected to participate in the elicitation of a social emotion in culture *A* compared to culture *B*. Indeed, this was the case for all five of the emotions studied herein. Of

course, a comprehensive mapping of cultural differences in emotion must also explain how and why social valuation varies across populations, and this will necessitate further inquiry.

Previous theories have assumed wholesale differences in emotion patterning or emotion activation across cultures (Benedict, 1946; Kuppens, Realo, & Diener, 2008; Mesquita, 2001; Suh, Diener, Oishi, & Triandis, 1998; Heine, Lehman, Markus, & Kitayama, 1999; Markus & Kitayama, 1991; Mosquera, Manstead, & Fischer, 2000; Boiger, Mesquita, Uchida, & Feldman Barrett, 2013; Uchida & Kitayama, 2009; Hofstede, 2001). Those theories have also assumed that sweeping cultural differences in emotion are caused by a single variable. Single-sources of cultural differences in emotion have been variously attributed to: individualism vs. collectivism (Kuppens, Realo, & Diener, 2008; Mesquita, 2001; Suh, Diener, Oishi, & Triandis, 1998), independent self vs. interdependent self (Heine et al., 1999; Markus & Kitayama, 1991), self-expression values vs. survival values (Kuppens et al., 2008), guilt cultures vs. shame cultures (Benedict, 1946), individualistic cultures vs. honor cultures (Mosquera, Manstead, & Fischer, 2000), Euro-American cultures vs. East Asian cultures (Boiger, Mesquita, Uchida, & Feldman Barrett, 2013; Uchida & Kitayama, 2009), and uncertainty avoidance (Hofstede, 2001). By contrast, under the present framework one expects finer fractionation of emotions across cultures (see also Sznycer et al., 2012). Which of two cultures will experience an emotion more intensely is a question that may not have a single answer, as that may sensitively depend on how those cultures value the particular acts or situations that trigger that emotion. This is not to say that wide-ranging differences in emotion cannot occur between different populations; they can, if the elicitors of emotion have broad effects in parameterizing the grammar of valuation. Previous accounts of cultural differences in emotion can account for many observations. However, an adaptationist approach appears to have the potential to produce a more nuanced picture of

cultural differences, to explain cross-cultural regularities and cross-cultural variation in emotion with a common explanatory framework, and to integrate psychological theories of emotion with the rest of science.

Past work has shown specificity in pride and shame's tracking of audience evaluations, insofar as pride uniquely tracks audiences' positive evaluations over and above other pleasant emotions (Sznycer, Al-Shawaf, et al., 2017), whereas shame uniquely tracks audiences' negative evaluations over and above other unpleasant emotions (Sznycer et al., 2016). The present findings also speak to the distinctness of multiple emotions, albeit only suggestively. Although the intensities of multiple emotions were moderately-to-strongly intercorrelated within and between countries, cross-national correlations of the same emotion (e.g., US pride with India pride) tended to be much larger than correlations of different emotions within or across countries. Thus, multiple emotions reliably organize their activation around a common suite of social valuations, and yet each emotion also appears to track a distinct set of situation features that are unique to its input-output logic.

This work has various limitations. The experimental design is not optimal for assessing specificity of emotion, and further research should therefore clarify the extent to which the emotions studied herein are functionally specialized and distinct (for steps in this direction, see: Sznycer et al., 2016; Sznycer, Al-Shawaf, et al., 2017; Robertson et al., 2014; Durkee et al., forthcoming). Further research is also necessary to determine whether the valuation–emotion links observed here generalize to other actions, traits, and eliciting situations, to the reactive (vs. prospective) operation of emotions, to the various mechanisms that emotions orchestrate, to other social and non-social emotions, and to other, non-English-speaking populations and cultures. Regarding the last point, we note that the within-country valuation–emotion correlations tended

to be somewhat lower in India than in the United States (Tables 1 & 2). This may be the result of noise, since a large proportion of Amazon Mechanical Turk Indian participants does not speak English as first language (Pavlick, Post, Irvine, Kachaev, & Callison-Burch 2014; Sznycer et al., 2016, studies S1b & S2b). This is speculation, however, as we restricted data collection to participants from the United States vs. India but did not collect data on participants' language or culture.

Concluding remarks

These findings provide further evidence for the existence of a universal grammar of social valuation and support the novel hypothesis that this grammar of valuation governs the activation of multiple social emotions. The present study contributes to a growing body of research indicating that adaptationism is a productive framework for mapping the information-processing structure and content of motivation and emotion.

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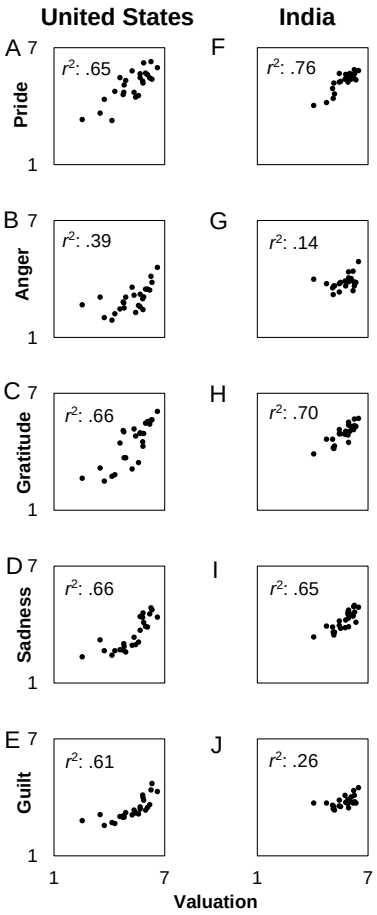
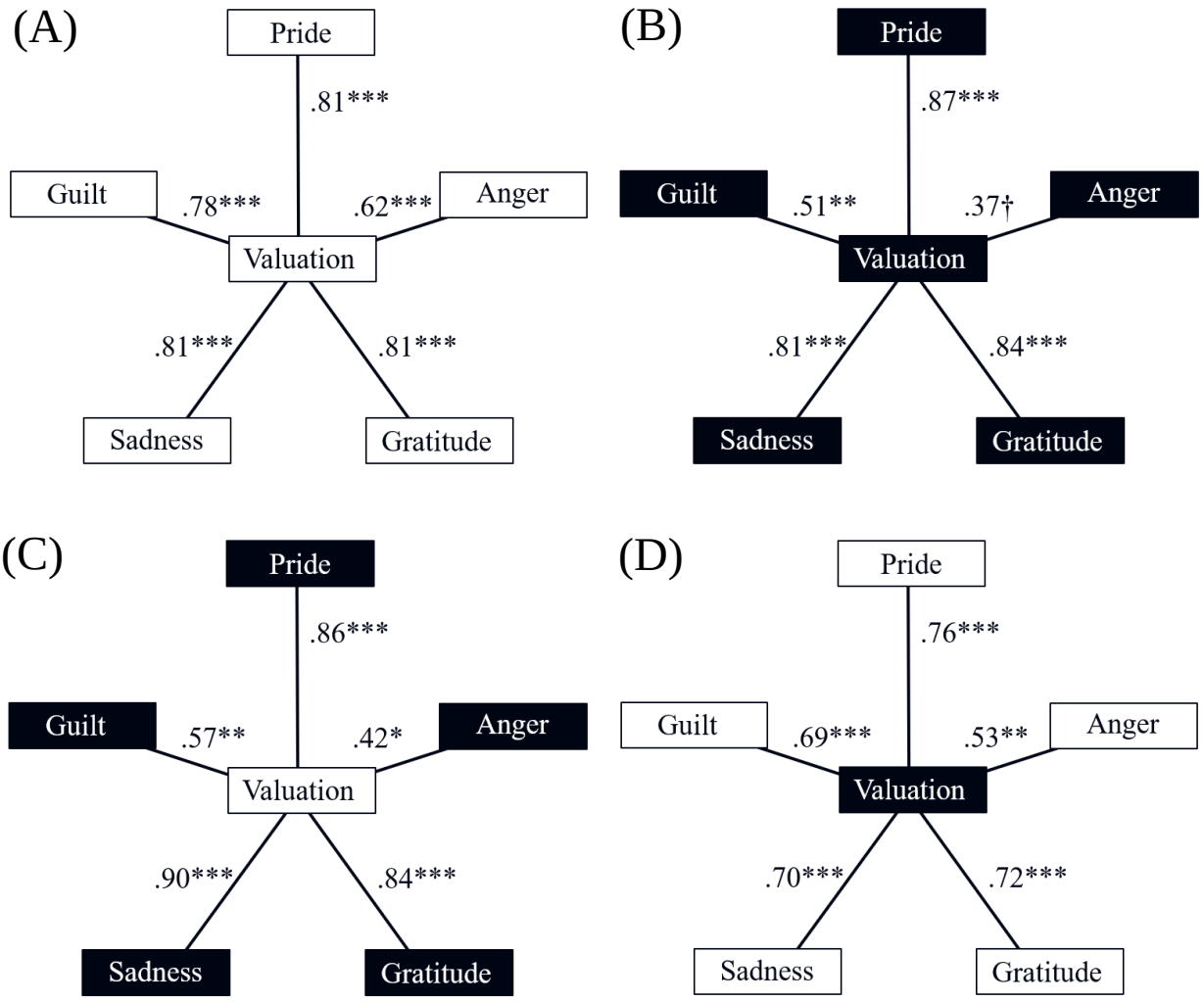
Figure 1
Scatter plots: Intensities of emotion as a function of valuation, by country



Note: Each point represents the mean valuation rating and mean emotion rating of one scenario. Ratings of valuation, pride, anger, gratitude, sadness, and guilt were given by different participants. N on which the correlations are based = number of scenarios = 25. Effect size: r^2 linear. United States data: panels A–E; India data: panels F–J.

Figure 2
Correlations between valuation and intensities of emotion, within- and between-countries



Note: (A) United States correlations (white boxes). (B) India correlations (black boxes). (C) Correlations between United States valuation and India emotions. (D) Correlations between India valuation and United States emotions. N on which the correlations are based = number of scenarios = 25. Ratings of valuation, pride, anger, gratitude, sadness, and guilt were given by different participants. *** $p < .001$; ** $p < .01$; * $p < .05$; † $.05 < p < .10$.

Table 1

Correlations between conditions, within- and between-countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Valuation_US												
(2) Pride_US	.81						.76					
(3) Anger_US	.62	.64					.53	.58				
(4) Gratitude_US	.81	.66	.67				.72	.74	.35			
(5) Sadness_US	.81	.66	.62	.72			.70	.61	.38	.73		
(6) Guilt_US	.78	.63	.72	.72	.90		.69	.60	.41	.72	.90	
(7) Valuation_IN	.95											
(8) Pride_IN	.86	.84					.87					
(9) Anger_IN	.42	.36	.64				.37	.34				
(10) Gratitude_IN	.84	.66	.63	.88			.84	.77	.37			
(11) Sadness_IN	.90	.67	.69	.82	.91		.81	.70	.41	.84		
(12) Guilt_IN	.57	.44	.73	.64	.65	.84	.51	.50	.53	.65	.69	

Note: Coefficients are Pearson's *r*s. N on which the correlations are based = number of scenarios = 25. Shaded cells: within-country correlations; non-grey cells: between-country correlations. US: United States; IN: India. Ratings of valuation, pride, anger, gratitude, sadness, and guilt were given by different participants. All *p*s < .05 (at least), except the underlined ones, where .05 < *p* < .10.

Table 2

Fixed effects of nation-specific valuation on emotion ratings, from mixed models

Predictor		**US Emotion**		**India Emotion**	
		Fixed effect [95% CI]	*t-test*	Fixed effect [95% CI]	*t-test*
US Valuation	Anger	.41 [.31; .50]	*t (983)=9.26, p*<.0001	.15 [.06; .24]	*t (695)=3.20, p*=.001
	Gratitude	.89 [.80; .99]	*t (959)=18.72, p*<.0001	.41 [.31; .50]	*t (695)=8.33, p*<.0001
	Guilt	.44 [.37; .51]	*t (935)=12.55, p*<.0001	.16 [.08; .23]	*t (671)=4.11, p*<.0001
	Pride	.68 [.59; .77]	*t (983)=15.19, p*<.0001	.42 [.35; .51]	*t (599)=9.81, p*<.0001
	Sadness	.65 [.59; .72]	*t (1007)=19.66, p*<.0001	.43 [.35; .51]	*t (767)=10.81, p*<.0001
India Valuation	Anger	.60 [.45; .75]	*t (983)=7.76, p*<.0001	.23 [.07; .38]	*t (695)=2.80, p*=.005
	Gratitude	1.37 [1.20; 1.54]	*t (959)=16.07, p*<.0001	.69 [.83; .95]	*t (695)=8.24, p*<.0001
	Guilt	.67 [.55; .79]	*t (935)=10.82, p*<.0001	.24 [.11; .37]	*t (671)=3.69, p*<.0001
	Pride	1.09 [.94; 1.25]	*t (983)=13.96, p*<.0001	.74 [.59; .88]	*t (599)=9.94, p*<.0001
	Sadness	.97 [.86; 1.09]	*t (1007)=16.32, p*<.0001	.66 [.52; .79]	*t (767)=9.53, p*<.0001

Note: In each mixed model, the intercept and slope of emotion ratings on nation-specific valuation ratings were modeled as fixed effects (using type III sum of squares), while the participant-level emotion intercept was modeled as a random effect.

Appendix

The emotion-valuation constellation:
Multiple emotions are governed by a common grammar of social valuation

Table S1

Condition prompts

Valuation	Next, we will ask you to imagine a number of hypothetical situations. Imagine that those situations happen to someone of your same sex and age. We ask you to indicate how you would view this person if they were in those situations. Please imagine each situation as vividly as you can, and answer as honestly and accurately as possible.
Pride	Next, we will ask you to imagine a number of hypothetical situations. We ask you to indicate how much pride you would feel if you were in those situations. Please imagine each situation as vividly as you can, and answer as honestly and accurately as possible.
Anger	Next, we will ask you to imagine a number of hypothetical situations. Specifically, we will ask you to imagine that various positive things are true of you. However, imagine that your friend fails to properly acknowledge these positive things about you. We will ask you to indicate how much anger you would feel if your friend fails to properly acknowledge those positive things about you. Please imagine each situation as vividly as you can, and answer as honestly and accurately as possible.
Gratitude	Next, we will ask you to imagine a number of hypothetical situations. Specifically, we will ask you to imagine that a good friend of yours spreads several pieces of positive information about you. This information is not exactly accurate. However, your friend convinces others that various positive things are true of you. We ask you to indicate how much gratitude you would feel toward your friend for convincing others that several positive things are true of you. Please imagine each situation as vividly as you can, and answer as honestly and accurately as possible.
Sadness	Next, we will ask you to imagine a number of hypothetical situations. Specifically, we will ask you to imagine that a neighbor of yours—a man, about whom you knew little—has recently died. We ask you to indicate how much sadness you would feel if you find out that several positive things were true of that man. Please imagine each situation as vividly as you can, and answer as honestly and accurately as possible.
Guilt	Imagine the following situation. You backed into someone's car and dented it. You thought of leaving a note with your insurance information, to help them out with the repair cost. But your insurance premium would have increased, so in the end you left without leaving a note. Their car was improperly parked, which is why, in part, you dented it. Still, you might have helped them out with the repair cost. No one saw you denting their car. And your car is intact, so there really isn't any evidence that you dented their car. A few days later you find out that the car you dented belongs to a neighbor of yours—a man, about whom you know little. We ask you to indicate how much guilt you would feel if you then learn that several positive things are true of your neighbor. Please imagine each situation as vividly as you can, and answer as honestly and accurately as possible.

The male versions of the prompts are presented. The female versions of the *sadness* and *guilt* prompts read “woman” instead of “man”.

Table S2

Ratings of valuation, pride, anger, gratitude, sadness, and guilt, by scenario: United States

#	Scenario	Valuation	Pride	Anger	Gratitude	Sadness	Guilt
18	You are trustworthy. / He is trustworthy.	6.59 (.72)	5.98 (1.33)	4.61 (2.29)	6.08 (1.14)	4.40 (1.77)	4.31 (2.14)
14	You are generous with others. / He is generous with others.	6.31 (.80)	5.40 (1.57)	3.83 (1.97)	5.65 (1.39)	4.77 (1.70)	4.72 (2.01)
4	You take very good care of your children. / He takes very good care of his children.	6.26 (1.02)	6.30 (.97)	4.15 (2.08)	5.63 (1.48)	4.86 (1.68)	4.38 (2.22)
22	People love your sense of humor. / People love his sense of humor.	6.18 (.85)	5.45 (1.54)	3.44 (2.20)	5.43 (1.32)	4.56 (1.61)	3.64 (1.99)
8	You are very smart. / He is very smart.	6.05 (.92)	5.63 (1.33)	3.49 (1.95)	5.55 (1.34)	3.88 (1.72)	3.49 (2.02)
16	You have many unique skills. / He has many unique skills.	5.95 (.76)	5.70 (1.36)	3.49 (2.00)	5.48 (1.32)	3.91 (1.78)	3.36 (1.91)
5	You can support your children economically. / He can support his children economically.	5.85 (1.11)	6.23 (1.07)	3.10 (2.00)	4.95 (1.65)	4.12 (1.37)	3.87 (2.18)
25	People think that you are the bravest man of your community. / People think that he is the bravest man of his community.	5.82 (1.05)	5.20 (1.59)	2.44 (1.55)	4.30 (1.59)	4.60 (1.75)	4.00 (2.28)
19	When there is a conflict in your community, people ask you to mediate between the two sides. / When there is a conflict in his community, people ask him to mediate between the two sides.	5.79 (1.06)	5.30 (1.38)	3.00 (1.67)	4.53 (1.66)	4.37 (1.65)	4.13 (2.18)
2	You host your extended family for a holiday meal; they think it's the best meal they've ever had. / He hosts his extended family for a holiday meal; they think it's the best meal they've ever had.	5.67 (1.11)	5.68 (1.44)	3.22 (1.85)	4.98 (1.69)	3.72 (1.76)	3.51 (2.00)
17	You have a lot of good friends. / He has a lot of good friends.	5.67 (1.06)	5.48 (1.28)	2.59 (1.70)	4.95 (1.34)	4.42 (1.92)	3.41 (1.97)
9	You have more years of education than those around you. / He has more years of education than those around him.	5.56 (1.21)	4.55 (1.81)	2.66 (1.96)	3.45 (1.99)	3.12 (1.59)	3.15 (2.06)
10	You have good table manners. / He has good table manners.	5.41 (1.14)	4.48 (1.66)	2.29 (1.49)	4.83 (1.58)	2.98 (1.54)	3.21 (2.08)
15	You are ambitious. / He is ambitious.	5.33 (1.03)	4.73 (1.71)	3.17 (2.07)	5.18 (1.48)	3.35 (1.89)	3.36 (1.98)
24	You finished first in a marathon. / He finished first in a marathon.	5.23 (1.22)	5.83 (1.66)	3.59 (1.91)	3.13 (1.88)	2.95 (1.68)	3.10 (2.07)
6	You are playing a throwing game with your friends. All your throws hit the target. / He is playing a throwing game with his friends. All his throws hit the target.	4.87 (1.17)	5.33 (1.64)	3.07 (1.69)	3.70 (1.80)	2.60 (1.45)	3.23 (2.16)
3	Your children are healthier and taller than average for their age. / His children are healthier and taller than average for their age.	4.79 (1.06)	5.10 (1.55)	2.51 (1.91)	3.70 (1.49)	2.88 (1.52)	3.00 (1.84)
12	You are physically attractive. / He is physically attractive.	4.77 (1.04)	4.73 (1.87)	2.78 (1.68)	5.03 (1.42)	3.02 (1.70)	3.08 (2.02)
1	You look ten years younger than you are. / He looks ten years younger than he is.	4.74 (1.04)	4.60 (1.82)	2.83 (1.82)	5.10 (1.69)	2.70 (1.41)	2.97 (2.12)
20	Your wife is the most attractive woman in your community. / His wife is the most attractive woman in his community.	4.56 (1.02)	5.48 (1.55)	2.46 (1.66)	4.45 (1.75)	2.72 (1.49)	3.03 (2.03)
13	You are wealthy. / He is wealthy.	4.28 (1.12)	4.78 (1.75)	2.22 (1.71)	2.83 (1.62)	2.67 (1.38)	2.67 (1.95)
21	You are the tallest in your circle of friends. / He is the tallest in his circle of friends.	4.13 (.98)	3.28 (1.69)	1.90 (1.55)	2.75 (1.48)	2.44 (1.42)	2.72 (2.03)

#	Scenario	Valuation	Pride	Anger	Gratitude	Sadness	Guilt
7	You come from a wealthy family with high status and many connections. / He comes from a wealthy family with high status and many connections.	3.72 (1.15)	4.35 (1.78)	2.02 (1.60)	2.50 (1.34)	2.67 (1.49)	2.56 (2.04)
23	An acquaintance of yours had been bullying you for a while. At some point you got tired of it, and you beat him very badly. You were never bullied again. / An acquaintance of his had been bullying him for a while. At some point he got tired of it, and he beat him very badly. He was never bullied again.	3.49 (1.62)	3.65 (1.96)	3.07 (1.90)	3.18 (2.06)	3.23 (1.70)	3.13 (2.02)
11	You get into a fight in front of everybody, and you completely dominate your opponent with punch after punch, until your opponent is knocked out. / He gets into a fight in front of everybody, and he completely dominates his opponent with punch after punch, until his opponent is knocked out.	2.51 (1.64)	3.33 (1.98)	2.68 (1.81)	2.65 (1.66)	2.35 (1.29)	2.82 (2.09)

Note. Displayed are means, with standard deviations in parentheses. *N*s: valuation: 39; pride: 40; anger: 41; gratitude: 40; sadness: 43; guilt: 39. The male versions of the pride/anger/gratitude scenarios and the valuation/guilt scenarios are presented before and after the slash, respectively. The sadness scenario # 3 ("His children are healthier and taller than average for their age") is the same as the valuation/guilt scenario # 3; the other 24 sadness scenarios are the same as the corresponding valuation/guilt scenarios, except that they are phrased in the past tense (e.g., sadness scenario # 1: "He looked ten years younger than he was). The female versions of the scenarios read "husband" (scenario # 20), "man" (scenario # 20), and "woman" (scenario # 25), instead of "wife," "woman," and "man". The female versions of the valuation/guilt/sadness scenarios featured a female target, so the pronouns were female pronouns. Otherwise, the male and female scenarios were identical. Scenarios are displayed from highest to lowest mean valuation scores.

Table S3

Ratings of valuation, pride, anger, gratitude, sadness, and guilt, by scenario: India

#	Scenario	Valuation	Pride	Anger	Gratitude	Sadness	Guilt
18	You are trustworthy. / He is trustworthy.	6.47 (.82)	5.84 (1.37)	4.90 (2.09)	5.72 (1.51)	4.91 (1.87)	4.50 (1.80)
10	You have good table manners. / He has good table manners.	6.33 (.96)	5.36 (1.35)	3.83 (2.05)	5.31 (1.49)	4.13 (1.74)	3.71 (1.67)
5	You can support your children economically. / He can support his children economically.	6.27 (1.01)	5.68 (1.46)	3.76 (2.03)	5.34 (1.47)	4.66 (1.93)	3.79 (1.52)
4	You take very good care of your children. / He takes very good care of his children.	6.23 (1.17)	5.88 (1.48)	3.66 (1.99)	5.69 (1.26)	5.00 (1.85)	4.11 (1.59)
14	You are generous with others. / He is generous with others.	6.20 (1.06)	5.60 (1.44)	3.86 (1.98)	5.14 (1.77)	4.94 (1.83)	4.36 (1.85)
16	You have many unique skills. / He has many unique skills.	6.17 (1.02)	5.48 (1.53)	4.41 (1.78)	5.24 (1.38)	4.47 (1.87)	3.75 (1.71)
17	You have a lot of good friends. / He has a lot of good friends.	6.17 (1.02)	5.48 (1.39)	3.41 (2.08)	5.31 (1.65)	4.44 (1.92)	3.71 (1.74)
19	When there is a conflict in your community, people ask you to mediate between the two sides. / When there is a conflict in his community, people ask him to mediate between the two sides.	6.07 (1.11)	5.40 (1.41)	4.03 (1.80)	5.31 (1.39)	4.53 (1.67)	4.04 (1.69)
8	You are very smart. / He is very smart.	6.00 (1.39)	5.68 (1.35)	4.00 (2.10)	5.07 (1.58)	4.47 (1.54)	3.82 (1.63)
15	You are ambitious. / He is ambitious.	5.93 (1.44)	5.44 (1.39)	3.86 (2.23)	5.52 (1.40)	4.34 (1.96)	3.89 (1.59)
24	You finished first in a marathon. / He finished first in a marathon.	5.93 (1.39)	5.64 (1.52)	4.07 (1.89)	4.48 (1.88)	3.91 (1.94)	3.46 (1.55)
22	People love your sense of humor. / People love his sense of humor.	5.93 (1.31)	5.56 (1.53)	4.38 (1.92)	5.38 (1.59)	4.75 (1.95)	3.79 (1.71)
9	You have more years of education than those around you. / He has more years of education than those around him.	5.90 (1.12)	5.24 (1.36)	3.97 (1.84)	4.97 (1.66)	4.53 (1.88)	3.68 (1.66)
25	People think that you are the bravest man of your community. / People think that he is the bravest man of his community.	5.90 (1.21)	5.32 (1.41)	3.93 (1.98)	4.86 (1.68)	4.66 (1.73)	3.89 (1.69)
2	You host your extended family for a holiday meal; they think it's the best meal they've ever had. / He hosts his extended family for a holiday meal; they think it's the best meal they've ever had.	5.77 (1.41)	5.64 (1.38)	3.66 (2.00)	5.07 (1.41)	4.25 (1.90)	3.75 (1.51)
6	You are playing a throwing game with your friends. All your throws hit the target. / He is playing a throwing game with his friends. All his throws hit the target.	5.73 (1.41)	5.40 (1.53)	3.90 (1.76)	4.90 (1.57)	3.84 (1.92)	4.11 (1.59)
3	Your children are healthier and taller than average for their age. / His children are healthier and taller than average for their age.	5.50 (1.43)	5.28 (1.40)	3.83 (2.09)	4.93 (1.49)	3.81 (1.89)	3.54 (1.57)
12	You are physically attractive. / He is physically attractive.	5.43 (1.48)	5.68 (1.38)	3.76 (2.15)	5.14 (1.48)	3.97 (1.91)	3.86 (1.72)
1	You look ten years younger than you are. / He looks ten years younger than he is.	5.43 (1.55)	5.24 (1.42)	3.34 (2.00)	4.93 (1.73)	4.19 (2.01)	3.57 (1.60)
13	You are wealthy. / He is wealthy.	5.17 (1.51)	4.64 (1.75)	3.66 (2.04)	4.31 (1.71)	3.63 (1.95)	3.36 (1.59)
7	You come from a wealthy family with high status and many connections. / He comes from a wealthy family with high status and many connections.	5.13 (1.53)	5.20 (1.58)	3.66 (2.00)	4.17 (1.79)	3.47 (1.74)	3.54 (1.79)
21	You are the tallest in your circle of friends. / He is the tallest in his circle of friends.	5.10 (1.67)	4.40 (1.78)	3.21 (1.90)	4.21 (1.84)	3.63 (1.70)	3.43 (1.62)

#	Scenario	Valuation	Pride	Anger	Gratitude	Sadness	Guilt
20	Your wife is the most attractive woman in your community. / His wife is the most attractive woman in his community.	5.07 (1.57)	4.92 (1.50)	3.55 (1.97)	4.66 (1.59)	3.88 (1.79)	3.61 (1.73)
23	An acquaintance of yours had been bullying you for a while. At some point you got tired of it, and you beat him very badly. You were never bullied again. / An acquaintance of his had been bullying him for a while. At some point he got tired of it, and he beat him very badly. He was never bullied again.	4.73 (1.82)	4.20 (1.83)	3.76 (1.62)	4.66 (1.91)	3.94 (1.81)	3.71 (1.61)
11	You get into a fight in front of everybody, and you completely dominate your opponent with punch after punch, until your opponent is knocked out. / He gets into a fight in front of everybody, and he completely dominates his opponent with punch after punch, until his opponent is knocked out.	4.03 (2.06)	4.04 (1.88)	4.00 (2.00)	3.90 (1.80)	3.38 (1.77)	3.71 (1.88)

Note. Displayed are means, with standard deviations in parentheses. *N*s: valuation: 30; pride: 25; anger: 29; gratitude: 29; sadness: 32; guilt: 28. The male versions of the pride/anger/gratitude scenarios and the valuation/guilt scenarios are presented before and after the slash, respectively. The sadness scenario # 3 ("His children are healthier and taller than average for their age") is the same as the valuation/guilt scenario # 3; the other 24 sadness scenarios are the same as the corresponding valuation/guilt scenarios, except that they are phrased in the past tense (e.g., sadness scenario # 1: "He looked ten years younger than he was). The female versions of the scenarios read "husband" (scenario # 20), "man" (scenario # 20), and "woman" (scenario # 25), instead of "wife," "woman," and "man". The female versions of the valuation/guilt/sadness scenarios featured a female target, so the pronouns were female pronouns. Otherwise, the male and female scenarios were identical. Scenarios are displayed from highest to lowest mean valuation scores.

Table S4

Partial correlations among emotion ratings, controlling for valuation ratings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Anger_US	--	.52**	.31	.31	.45*	.57**	.29	.21	.19	.33
(2) Anger_IN	.53**/.56**	--	-.01	.07	.02	.38	.04	-.01	.04	.05
(3) Gratitude_US	.35/.48*	.01/.12	--	.72***	.18	.36	.01	.24	.11	.30
(4) Gratutude_IN	.24/.40	.04/.13	.64**/.74***	--	.24	.40	-.05	.11	.22	.47**
(5) Guilt_US	.48**/.58**	.14/.23	.23/.44*	.17/.36	--	.77***	.00	-.15	.71***	.68***
(6) Guilt_IN	.58**/.63***	.39/.43*	.37/.46*	.37/.46	.77***/.78***	--	-.06	.06	.37	.48*
(7) Pride_US	.29/.42*	.04/.14	.02/.26	-.05/.09	.01/.24	-.06/.08	--	.53**	.00	-.26
(8) Pride_IN	.11/.29	-.05/.04	.14/.32	.18/.18	-.22/.01	.02/.13	.49*/.57**	--	-.19	-.29
(9) Sadness_US	.26/.41*	.07/.18	.18/.43*	.13/.35	.73***/.81***	.38./.47*	.01/.27	-.28/.00	--	.68***
(10) Sadness_IN	.39/.53**	.08/.21	.35.58**	.36/.53**	.71***/.79***	.48*/.54**	-.23/.16	-.37/-.02	.71***/.82***	--

Note: Partial correlations above the diagonal control for both US and India valuation ratings. Beneath the diagonal, within each cell, partial correlations on the left control for US valuation ratings and partial correlations on the right control for India valuation ratings. Shaded cells indicate correlations between an emotion and itself (across US and India); non-shaded cells indicate correlations between an emotion and a different emotion. N on which the correlations are based = number of scenarios = 25. *$p < .05$; ** $p < .01$; *** $p < .001$.

Table S5

Country-level differences in valuation, pride, anger, gratitude, sadness, and guilt, by scenario

#	Scenario	Valuation	Pride	Anger	Gratitude	Sadness	Guilt
1	You look ten years younger than you are. / He looks ten years younger than he is.	**.29**	.18	.13	–.05	**.40**	.15
2	You host your extended family for a holiday meal; they think it's the best meal they've ever had. / He hosts his extended family for a holiday meal; they think it's the best meal they've ever had.	.04	-.01	.11	.03	.14	.07
3	Your children are healthier and taller than average for their age. / His children are healthier and taller than average for their age.	**.28**	.06	**.31**	**.38**	**.27**	.15
4	You take very good care of your children. / He takes very good care of his children.	–.01	–.17	–.12	.02	.04	–.07
5	You can support your children economically. / He can support his children economically.	.19	–.21	.16	.12	.18	–.02
6	You are playing a throwing game with your friends. All your throws hit the target. / He is playing a throwing game with his friends. All his throws hit the target.	**.32**	.02	.23	**.33**	**.35**	.23
7	You come from a wealthy family with high status and many connections. / He comes from a wealthy family with high status and many connections.	**.47**	.24	**.45**	**.48**	**.24**	**.24**
8	You are very smart. / He is very smart.	–.02	.02	.13	–.16	.18	.09
9	You have more years of education than those around you. / He has more years of education than those around him.	.14	.20	**.32**	**.38**	**.38**	.14
10	You have good table manners. / He has good table manners.	**.40**	**.27**	**.44**	.16	**.33**	.13
11	You get into a fight in front of everybody, and you completely dominate your opponent with punch after punch, until your opponent is knocked out. / He gets into a fight in front of everybody, and he completely dominates his opponent with punch after punch, until his opponent is knocked out.	**.39**	.18	**.33**	**.34**	**.35**	.22
12	You are physically attractive. / He is physically attractive.	**.26**	**.29**	**.25**	.04	**.26**	.20
13	You are wealthy. / He is wealthy.	**.32**	–.04	**.36**	**.41**	**.28**	.19
14	You are generous with others. / He is generous with others.	–.06	.06	.01	–.16	.05	–.09
15	You are ambitious. / He is ambitious.	**.24**	.22	.16	.12	**.25**	.14
16	You have many unique skills. / He has many unique skills.	.13	–.08	.23	–.09	.15	.11
17	You have a lot of good friends. / He has a lot of good friends.	.23	.00	.22	.12	.00	.08
18	You are trustworthy. / He is trustworthy.	–.08	–.05	.06	–.13	.14	.05

#	Scenario	Valuation	Pride	Anger	Gratitude	Sadness	Guilt
19	When there is a conflict in your community, people ask you to mediate between the two sides. / When there is a conflict in his community, people ask him to mediate between the two sides.	.13	.04	**.29**	**.25**	.05	–.02
20	Your wife is the most attractive woman in your community. / His wife is the most attractive woman in his community.	.19	–.18	**.29**	.06	**.34**	.15
21	You are the tallest in your circle of friends. / He is the tallest in his circle of friends.	**.39**	**.31**	**.36**	**.41**	**.36**	.19
22	People love your sense of humor. / People love his sense of humor.	–.11	.04	.22	–.02	.05	.04
23	An acquaintance of yours had been bullying you for a while. At some point you got tired of it, and you beat him very badly. You were never bullied again. / An acquaintance of his had been bullying him for a while. At some point he got tired of it, and he beat him very badly. He was never bullied again.	**.34**	.14	.19	**.35**	.20	.16
24	You finished first in a marathon. / He finished first in a marathon.	**.26**	–.06	.13	**.34**	**.26**	.10
25	People think that you are the bravest man of your community. / People think that he is the bravest man of his community.	.04	.04	**.43**	.17	.01	–.03
Across all scenarios		**.42**	.11	**.29**	**.29**	**.25**	.12

Note. Displayed are the effect sizes (*r*) corresponding to the country-level differences. Positive values: India mean > United States mean; negative values: India mean < United States mean; bolded values: *p*-value of the difference < or << .05; non-bolded values: p-value of the difference ≥ .05.