

## Emotions and cost/benefit assessment

The role of shame and self-esteem in risk taking

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## ABSTRACT

Ethnographic and experimental findings indicate that emotions influence decision making in a number of ways, including the weighting of cost/benefit assessments. One pair of emotions, Shame and Pride, bias such assessments in the service of both rank-striving and approval-seeking behaviors. The frequency with which these emotions influence decision making is determined by self-esteem, a mechanism which sums events to date. This allows for the adjustment of risk taking choices in light of future prospects. Studies of humans and nonhuman primates suggest that serotonin, a neurotransmitter, plays a key role in such a system. In the environment in which humans evolved, this patterned attunement of cost/benefit assessments would have optimized fitness.

## INTRODUCTION

The world is not intrinsically divided into options. Instead, an organism must parse stimuli in such a way as to define events, and thus to define choices. Because decision making is logically prior to action, we can expect that natural and sexual selection will have acted to create in organisms the capacity to divide up the world in this manner in order to facilitate adaptive behavior (Tooby and Cosmides 1990). Finer parsing of the environment produces greater flexibility and complexity of behavior: Whereas a single-celled organism may chunk the world along only a few axes (warm versus cold, edible versus toxic, etc.), and may possess only a few responses (approach versus avoid, etc.), creatures as complex as mammals divide the world into many more categories, and possess a much wider range of responses. Such complexity introduces still more complexity, as meta-decisions must then be addressed, i.e., it becomes necessary to prioritize decisions to be made. Humans, and probably other mammals, (and perhaps other vertebrates), seem to manage these various demands not through brute information-processing power, but rather through discrete decision making apparatus which shape and constrain the tasks at hand. Specifically, it appears that emotions are integral parts of decision making mechanisms which parse the world into decisions, prioritize some decisions over others, and weight particular options within decisions (*ibid.*)<sup>1</sup>

Any decision embodies an assessment of the future, for the value of a given option is contingent on what the organism's circumstances are likely to be the next moment, day, year, or decade. Organisms thus require a means of prognostication. The most reliable way of predicting the future is to extrapolate from the past. Organisms therefore probably possess mechanisms which aggregate experience and, in so doing, influence the proximate mechanisms of decision making. In this paper I will argue that a pair of emotions, shame and pride, importantly influence decision making. These emotions, in turn, are linked to self-esteem, a mechanism which sums experience to date (where the nature of that experience is itself defined in emotional terms). The result is a decision making system which adjusts risk taking behavior in accord with probable future opportunities, where such opportunities are predicted on the basis of past events.

## DRIVES AND EMOTIONS

Observing patterned, species-typical behavior which appears strongly goal-oriented, investigators have often posited the existence of discrete drives. However, “drive” is simply a label for a black box -- the mechanism is defined wholly in terms of its output. Moreover, when we examine actual human behavior, we find that informants often explain actions largely in terms of emotions. Individual emotion events, while importantly shaped by both idiosyncratic past experience and the cultural context, are nonetheless constructed upon panhuman capacities and proclivities to experience particular reactions to particular classes of events. Presumably, such marked and pervasive features evolved because they provided adaptive advantages to those who possessed them (Tooby and Cosmides 1990).

How might emotions be advantageous? First, emotions inform the individual about how she currently stands in relation to the world. Each emotion is an integral part of a system which parses the world into decision categories by ‘telling’ the individual about particular types of relationships with the world (ibid.). Fear, for example, is a way of ‘knowing’ that the environment is threatening to the individual -- the emotion, elicited by particular stimuli in the environment, tags a particular type of event in the world, causing it to be salient. Second, emotions heighten and prolong monitoring of stimuli relevant to the given type of event, probably at the expense of other stimuli -- fear maintains the attention directed at potentially threatening stimuli (reviewed in Mineka and Sutton 1992). Third, emotions influence the recall of stored information, as memories relevant to the given type of event become more accessible, while other information is more difficult to recall -- during an exam, a fearful student may be able to remember how one can escape from frightening situations, but he may be unable to recall the course material.<sup>2</sup> Fourth, emotions proportionately influence meta-decision making (Tooby and Cosmides 1990) -- the experience of intense fear prioritizes decisions concerning the eliciting threat ahead of any other decisions, such as what to have for dinner. Fifth, emotions help to constrain the available choices to those which will address the eliciting event (ibid.) -- fear may or may not assist an individual in deciding which way to flee (see endnote), but it clearly inclines the individual to flee, rather than to engage in any of an infinite variety of other possible behaviors.<sup>3</sup> Sixth, because they are distinctly rewarding or aversive, emotions direct decision making in a number of ways. In the simplest case, individuals experience an emotion and then act to either terminate or extend the circumstances which elicited it, depending upon the emotion’s hedonic value. More complexly, as a consequence of past experience, individuals actively seek to either create or avoid the circumstances which elicit a given emotion. Furthermore, emotions are sometimes paired such that *situation X* elicits a rewarding emotion, while *situation NOT-X* elicits an aversive emotion. This redundancy increases the likelihood that an actor will seek out or avoid particular types of situations, that is, it lends robustness to the ordered nature of decisions. Seventh, as will be discussed at length below, emotions may influence decision making by affecting the relative salience or weight of costs versus benefits. Finally, because multiple emotions may be elicited simultaneously, emotions’ influence on decision making is sometimes the product of the interaction among emotions. When two emotions having

antithetical features, such as fear and love, are elicited simultaneously, indecision may occur (until such time as one emotion is more strongly elicited). Conversely, when two emotions having complementary features, such as fear and disgust, are elicited simultaneously, the result may be an additive influence on decision making. In sum, evolution appears to have patterned decision making, and hence behavior, by shaping the eliciting conditions, cognitive consequences, action tendencies, hedonic values, and biasing effects of specific emotions. We can therefore think of “drives” as consisting of evolved sets of emotions which work together to produce particular outcomes in particular circumstances.

## SHAME AND RISK

All decisions involve a weighing up of the relative costs and benefits of different courses of action. As noted above, emotions influence decision making in part by biasing some outcomes over others. Sometimes, such biasing is in keeping with a common-sensical understanding of the ‘sensible’ choice in the given situation -- the benefits of running away from a large predator obviously far outweigh the costs, and hence we are content to describe the decision to flee as ‘sensible’ even if, in fact, it was the product of an emotional reaction rather than a conscious calculation. Often, however, common-sensical assessments view emotional decisions as ‘senseless,’ particularly when the potential costs, or risks (the costs considered in light of the likelihood that they will be incurred), seem to outweigh the potential benefits. Nowhere is this more true than in instances of spontaneous violence. Below is a case drawn from my anthropological fieldwork in Bengkulu, southwestern Sumatra:

Rustam and his girlfriend left the party around 11:30 p.m. They found a minibus and, after bargaining with the driver and his assistant, they set off. As they neared Rustam’s village, a disagreement arose over the fare. The discrepancy was 50 rupiah, the price of a single cracker at a village shop. Words were passed. A fight began. The two young men stabbed Rustam 14 times and dumped him by the side of the highway. He died as his girlfriend knelt wailing at his side.

The next day, after the killers had been arrested, the body had been buried, and the stain by the highway had been washed away, people gathered in the shops. “They must’ve been possessed by the Devil!” several old men said, “Imagine, killing somebody over 50 rupiah. Only a madman would do such a thing!” But the young men knew that possession and insanity were only metaphors. “It was all because of *malu*,” one said, and others nodded. “No one wants to be *malu* in front of a girl.”

Viewed cross-culturally, Rustam’s death was a prototypical murder. Violent interactions frequently involve young men, and frequently begin as altercations over trivial points, often with an audience looking on (Daly and Wilson 1988). From a common-sensical position, such events seem notably senseless, as the contested point appears insignificant relative to the potential costs. However, as Daly and Wilson have compellingly argued, it is likely that young men possess the propensity to make such choices because, in our evolutionary past, such reactions would have allowed a maturing male with little status or influence to rapidly establish a reputation as someone to be taken seriously in the highly competitive male social arena. Hence, if utility is defined in terms of inclusive fitness, while such a choice may or may not be rational now, it was rational in the evolutionary context in which it arose (cf. Hammerstein, this volume) -- given high variance in male reproductive success, risk taking made sense for young males with uncertain futures.

Note that the above explanation operates at the ultimate level -- we have an account of why a predisposition exists, but not of how it operates. To gain insight into the proximate workings of the system, we return to informants' analyses of events. In explaining the combatants' behavior, villagers made frequent reference to *malu*, an aversive, shame-like emotion. Apparently, the experience of this emotion (combined with the prospect of its intensification) colored the participants' assessments of the costs and benefits of escalation. In order to understand why *malu* had this effect, we must explicate this emotion more fully.

It is possible to describe an emotion in terms of what I call its 'logic,' that is, the abstracted set of conditions wherein it is experienced. The Bengkulu emotion *malu*, like the English emotion *shame*, is characterized by the following 6-point logic:

- 1) Ego<sup>4</sup> violates a norm
- 2) Ego is aware of his failure
- 3) an Other is also aware of Ego's failure
- 4) Ego is aware of the Other's knowledge
- 5) the Other displays hostility and revulsion towards Ego
- OR - Ego assumes that Other experiences hostility and revulsion towards Ego
- 6) as a consequence of the above, Ego experiences an aversive emotion

Conversely, *bangga*, the opposite of *malu*, is characterized by the same logic as the English emotion *pride*, the opposite of *shame*:

- 1) Ego successfully fulfills a norm
- 2) Ego is aware of her success
- 3) an Other is also aware of Ego's success
- 4) Ego is aware of the Other's knowledge
- 5) Other displays towards Ego either i) a positive appraisal and affection, or  
ii) a positive appraisal and hostility
- OR - Ego assumes that Other experiences (i) or (ii) towards Ego
- 6) as a consequence of the above, Ego experiences a pleasurable emotion

At first glance it thus appears that *malu* and *shame* are isomorphic, as are *bangga* and *pride*. Moreover, cross-cultural comparison (see Fessler 1999) reveals that disparate cultures possess the same pair of opposing 6-point logic emotions, suggesting that a shame-like emotion and a pride-like emotion are probable human universals. However, this observation does not in itself shed light on how a shame-like emotion could have led to Rustam's murder, since the fight did not revolve around any clear violation of a norm. To understand the connection between *malu* and violence, we must explore this emotion still further.

In addition to being characterized by the 6-point logics, *malu* and its opposite, *bangga*, are also characterized by simpler 3-point logics, as follows:

- 1) Ego assesses an Other as significantly more important than Ego
- 2) Ego must interact with the Other in a situation in which the discrepancy between Ego and the Other is salient for Ego

3) as a consequence of the above, Ego experiences an aversive emotion and

- 1) Ego assesses an Other as significantly less important than Ego
- 2) Ego must interact with the Other in a situation in which the discrepancy between Ego and the Other is salient for Ego

3) as a consequence of the above, Ego experiences a pleasurable emotion

Moreover, it is clear that these are not cases of simple polysemy, as the same display and outcome behaviors, familiar to English speakers, are associated with each term whether it is in regard to the 6-point or the 3-point logic:

*malu*:

- 1) averted gaze
- 2) face turned down and away from others
- 3) stooped shoulders
- 4) shrinking posture
- 5) bent-kneed, shuffling gait
- 6) reddening of the face and neck
- 7) attempts to avoid being seen, culminating in flight

*bangga*:

- 1) eye contact sought
- 2) face slightly elevated and turned towards others
- 3) squared shoulders
- 4) erect posture
- 5) stiff-legged gait
- 6) seeks out opportunities for exhibition

Cross-cultural comparison (see Fessler 1999) indicates that English is unusual in its failure to recognize these 3-point logics -- around the world, diverse cultures concur that each of these emotions is characterized by both a 6-point and a 3-point logic. Moreover, there is evidence that English speakers are capable of experiencing shame-like and pride-like reactions under the 3-point conditions despite the absence of a cultural label (see Fessler 1999). It therefore appears that the universal emotions, which we can label Shame and Pride, are each characterized by both a 6-point and a 3-point logic. Importantly, unlike the 6-point logics with their focus on norm violation, the 3-point logics revolve primarily around questions of dominance and subordination. It is this latter facet of Shame to which the Bengkulu villagers were referring when they cited *malu* as the cause of Rustam's death, for physical combat is the most elementary form of the struggle for dominance. Still, understanding that subordination elicits an aversive emotion does not explain why the altercation on the minibus continued to escalate even after violence became a foreseeable outcome -- surely being hurt or killed is more aversive than being ashamed?

Before exploring further the nature of Shame and Pride, consider the following: In a series of experiments involving real-world consequences of demonstrated personal significance,

Baumeister, Heatherton, and Tice found that a class of North American subjects exposed to “ego threat” (negative feedback on ability, i.e., conditions meeting the 6-point logic of Shame) adopted “a high-risk, high-payoff strategy that offered the individual a chance at a glorious success -- but that increased the danger of costly failure,” (1993:153). Using different methods, Leith and Baumeister (1996) then examined the effects on decision making of “embarrassment” (produced by demonstrating the subject’s inadequacy, i.e., what I would again term Shame) and “anger” (produced by having the subject vehemently act out a hostile response to someone who had enangered the subject). Subjects who were experiencing either of these emotions followed high-risk, high-gain strategies when making choices which (the subjects believed) would have real-world impact on them. In contrast, such strategies were avoided by other subjects who were experiencing happiness, sadness, or an emotionally neutral condition at the time of decision making. Subjects who were experiencing shame and anger “seem[ed] merely to seek out the best possible outcome and grab for it, without being deterred by rational [sic] cost-benefit calculations or even by the prospect of possible unpleasant consequences,” (1996:1264). Relatedly, an increasing body of clinical literature ties shame to aggression in Western settings, and ethological investigations of dyadic interactions which end in aggression reveal a sequence of display behaviors in which rage is preceded by shame (Retzinger 1991).<sup>5</sup>

It appears that when people feel either intense Shame or intense anger, they disregard both the likelihood that a given goal will be achieved and the potential costs entailed if failure occurs, and instead choose a course of action solely with an eye to maximal benefit. This finding is consistent with Bengkulu accounts of conflicts among young men, as increasingly intense Shame and anger eventually lead participants to willingly expose themselves to enormous risks. To see why Shame has this effect, and why it is often linked to anger, we must explore the evolutionary history of Shame and Pride, as an understanding of the factors which led to the development of these emotions will shed light on how and why they influence decision making today.

## THE PHYLOGENETIC DEVELOPMENT OF SHAME AND PRIDE

To begin with, consider the differing cognitive demands entailed by the 6-point and 3-point logics. The 6-point logics are premised on the ability to manipulate a ‘theory of mind’ (Ego must know what it is that the Other knows about Ego, etc.). In contrast, the 3-point logics have no such requirements -- the Other is viewed not as a target for intersubjectivity, but merely as a feature of the social world. Next, consider this distinction in light of the display behaviors of Shame and Pride, which we can summarize as follows:

	Shame	Pride
<u>eye contact</u>	avoided	sought
<u>manipulation of apparent body size</u> <sup>6</sup>	smaller than baseline state	larger than baseline state
<u>visibility and social interaction</u>	avoided	sought

In many primates and other animals, staring is an important part of threat behavior, while gaze avoidance is a component of appeasement behavior. In many, perhaps most vertebrates, increasing apparent body size is a component of threat behavior, while decreasing it is a component of appeasement behavior. Seeking visibility is a central part of many primate threat displays, while avoiding interacting with others or attracting attention to oneself is often a form of submission (see Fessler 1999 for discussion and citations).<sup>7</sup>

We can summarize the above by stating that the displays associated with the postulated universal emotions Shame and Pride are composed of components used for the negotiation or reaffirmation of relative rank. Note therefore that the 3-point logics of Shame and Pride, which focus on dyadic interactions and revolve around issues of rank, are more congruent with the associated display behaviors than are the 6-point logics. It thus appears that the 3-point versions of Shame and Pride initially developed to shape rank-related behavior. The 6-point logics, with their reliance on a theory of mind, apparently only appear much later in the course of human evolution, after hominid cognitive capacities had increased significantly. It is plausible that initially the 6-point logics served the same purpose as the 3-point logics, focusing on rivalry -- a defeated contestant in an agonistic interaction feels Shame before his rival in part because he knows that his rival knows that he has failed. Although this facet of the emotion persists to the present, it has been importantly overlaid by a focus on interaction with an audience rather than with a rival. This focus is most likely an evolutionarily recent addition, selected for as increases in cognitive sophistication made complex cooperation possible, thereby creating benefits for those who sought group approval (see Fessler 1999).

The two opposing configurations of the 3-point logics, subjective experiences, and display behaviors of Shame and Pride are thematically integrated. We can label these integrated configurations Protoshame and Protopride in order to distinguish these emotions from the more complex forms which involve both the 3-point and 6-point logics. Focusing on the consequences of the hedonic values of Protoshame and Protopride offers an explanation of why humans (and probably other creatures) possess emotions centering on issues of rank. In general, rank is positively correlated with reproductive success. Because Protoshame, an aversive emotion, is elicited by subordination, while Protopride, a rewarding emotion, is elicited by dominance, individuals capable of experiencing these emotions would have been motivated to seek out higher rank. Hence, individuals who possessed the capacity and proclivity to feel these emotions would have had greater reproductive success than those who lacked these traits. Relatedly, the existence of the respective displays is a consequence of simple economics: It is always 'cheaper' to signal superiority or inferiority than to demonstrate it in a contest, and hence selection favored individuals who experienced both the motivational and the communicative aspects of these emotions.<sup>8</sup>

## **PROTOSHAME, RANK, AND DECISION MAKING**



We can summarize the decision making functions of Protoshame as follows: First, Protoshame calls Ego's attention to a particular facet of his relationship with his surroundings by informing him that he is in an inferior position relative to an Other, i.e., it tags a decision domain. Second, Protoshame directs increased attention to cues indicative of relative social standing. Third, Protoshame makes it extremely aversive for Ego to be in the subordinate position. This can affect action in two ways: a) Ego may regularly seek to avoid being subordinate so as to preclude an aversive emotional experience, i.e., the emotion may bias anticipatory decisions; or b) if Ego finds himself in a subordinate position, he may seek to get out of it as soon as possible so as to end the aversive emotional experience, i.e., the emotion may bias reactive decisions. Both (a) and (b) are reinforced by Protopride, as Ego will both regularly seek to be dominant and regularly seek to invert a relationship in which he is subordinate so as to attain the rewarding experience of Protopride.

We can express the above account in terms of Protoshame's influence on cost/benefit assessments as follows: If utility is defined in terms of fitness, then, because subordination is inversely correlated with reproductive success, the more that Ego is subordinate, the more he should discount costs and focus on benefits when considering actions which may improve his social standing. The individual at the bottom of the dominance hierarchy, facing a high probability of leaving no descendants, should be willing to take large risks to improve his situation, while the individual at the top of the hierarchy, being very likely to leave many descendants, should be relatively conservative about risk. Emotions are calibrated to the intensity of the situation which arouses them, hence mild subordination elicits mild Protoshame, while intense subordination elicits intense Protoshame. As a result, the influence of Protoshame on the relative salience of cost and benefit is proportional to, and reflective of, the degree to which the eliciting event indicates a decline in Ego's probable future fitness.

Before going on to consider the analogous influence of Shame, we must pause to consider why the experience of Protoshame leads to flight in some situations and aggression in others. We can distinguish two types of subordination events. In one, Ego is subordinate purely by virtue of his own inadequacy (think of missing easy shots in a tennis match). In the other, a condition commonly labeled humiliation, Ego is subordinate because the other has actively revealed Ego's inadequacy (think of the tennis player who toys with his opponent, then resoundingly defeats him). When Ego feels Protoshame in the first type of situation, he is made aware that, by virtue of features of himself, he now occupies a lower position in the hierarchy. Unlike a dispassionate recognition of this fact, the subjective experience of Protoshame forces Ego to attend to this change in status and to take appropriate action: Since his subordination is a result of his own failings, the best tactic is to withdraw from interaction in a headlong fashion (i.e., 'blind' to obstacles or other costs) before his position worsens. In contrast, when Ego feels Protoshame in the second type of situation, he is forced to recognize that an Other has used features of Ego to lower his position in the hierarchy. Once again, emotions function to make these events highly salient and motivationally significant. When Ego feels Protoshame in such a situation, the

possibility exists that, since his subordination is only partly due to his own failings, and partly due to the actions of the Other, attacking the individual who dominates him may invert the dominance relationship. Moreover, in this situation, Protoshame, acting as a proxy for the damage done to Ego through a reduction in his future fitness prospects, is experienced as harm.

Recognizing that an Other is responsible for that harm elicits a second emotion, one attuned to transgressions against Ego, namely anger.<sup>9</sup>

The principal action tendency associated with anger is the attempt to inflict harm on a transgressor. In addition, as noted earlier, like Shame, anger leads to an indifference to risk. As a consequence of these two features, individuals who experience anger are likely to inflict significant harm on a transgressor, even at great cost to themselves. By increasing the costs incurred by the transgressor, Ego's anger makes such transgressions less attractive for the Other, and thus generally helps to protect Ego against further transgressions. Moreover, the more intense the reaction, and the lower the threshold for elicitation, the greater this prophylactic effect, and the more likely it is that minor transgressions will provide a learning opportunity for Others whereafter they will refrain from transgressing against Ego (cf. Daly and Wilson 1988). Rivalrous interactions which elicit both Protoshame and anger are likely to produce particularly dramatic responses, as the two emotions have a compound effect in decreasing the salience of potential costs. Note that because the antidote to subordination is dominance, Ego may seek to exploit the Other's failings in order to assert his own superiority, a tactic which is likely to elicit both Protoshame and anger in the Other. As a consequence of these two effects, Ego's actions will produce a similar indifference to cost in the Other, and will prompt similar reactive aggression from the Other. Furthermore, because anger and Protoshame increase the salience of the eliciting stimuli, both Ego and Other become acutely sensitive to the possibility that one another's actions constitute further transgressions and attempts at subordination. This heightened sensitivity causes an increase in both the disproportionateness and the certainty of the two actors' reactions to one another. The net result is often a runaway escalation of aggressive interaction such as that which claimed Rustam's life (cf. Retzinger 1991).

## **SHAME, CONFORMITY, AND DECISION MAKING**

Although Protoshame and anger can explain why participants in trivial altercations may come to disregard the risks of escalating conflict, they cannot account for the significance of an audience in exacerbating such confrontations. Likewise, these emotions cannot explain the indifference to risk which is characteristic of a wide variety of behaviors that we might label 'showing off' (think of teenagers in a fast car). Rather, these situations pertain to the phylogenically more recent facet of Shame, the 6-point logic. Importantly, the 6-point logic revolves around Ego's assessment of an Other's assessment of Ego. As noted earlier, I believe that this logic arose in response to the fitness advantages offered by participation in cooperative endeavors. Sensitivity to others' expectations, and motivation to conform to them, leads Ego to adhere to standards for behavior. In turn, this makes Ego a reliable and thus desirable member of

cooperative groups. Hence, an existing mechanism, initially designed to promote rank-striving, was, through the addition of another cognitive level, co-opted to promote conformity. Note, however, that while the intrinsic goals of this newer aspect of Shame differ from those of Protoshame, the implications for decision making are similar: By highlighting stimuli indicative of negative social evaluation, and thus marking potential group rejection resulting from Ego's failure to live up to standards, the 6-point logic of Shame is also marking a drop in Ego's probable future fitness, since exclusion from cooperative ventures is costly. Accordingly, if Ego believes that Others think poorly of her, it is adaptive to adopt desperate measures to try to improve her standing. At still higher levels of intensity, the individual may flee as soon as possible in order to decrease the social prominence of her failure, then search ardently for an opportunity to redeem herself before the group. In extreme instances the individual may emigrate, seeking a new group which knows nothing of her past failure. In all cases, as is true of Protoshame, the intensity of the emotion, a marker of the severity of the threat to future fitness, corresponds with the degree of indifference to risk and focus on benefit.

Note that the above position implies that the larger the audience, the more significant any failures or successes will be, since such events will have a greater impact on Ego's opportunities to participate in cooperative activities. In accord with this prediction, both introspection and ethnographic observations from Bengkulu (author's unpublished data) suggest that the intensity of Shame or Pride experienced is in part contingent on the size of the audience present. We can therefore expect that the degree to which failures result in indifference to risk will be in part dependant on the number of witnesses. Likewise, because the strength of the Shame response elicited by being subordinated by a rival is in part a product of the number of witnesses, humiliation before a larger audience will elicit more intense anger, with correspondingly greater indifference to risk and motivation to harm the transgressor. Finally, note that this perspective can also explain why the composition of the audience affects the intensity of emotions elicited by failure or success: If the proclivity to attend to the judgements of an audience is an adaptation selected for by the benefits of inclusion in cooperative endeavors, then it follows that the influence of the audience on the intensity of emotions elicited will in part be a function of a) the degree to which the audience is composed of potential collaborators, and/or b) the value of those potential collaborators. Hence, both peers, who are likely collaborators, and superiors, who are valuable potential collaborators, can constitute highly evocative audiences. Conversely, individuals who belong to a disparate social group (i.e., different culture, ethnicity, etc.), or with whom Ego is unlikely to have future interactions (i.e., inhabitants of an area that Ego is visiting only temporarily), constitute far less evocative audiences. In sum, via the intensity of the emotions elicited, both the size and the composition of an audience can influence decision making in the wake of public events.

## **PREDICTION, SELF-ESTEEM, AND THE INTERPRETATION OF EVENTS**

I have argued that the various facets of Shame adjust the salience of risk and benefit in

response to events which indicate probable changes in future prospects. However, this explanation ignores the problem of the interpretation of the meaning of any given event. How do individuals gauge the severity of events, that is, how are they able to calibrate the appropriate intensity of emotional response, along with the concomitant biasing of cost/benefit assessments? Importantly, the significance of any given event is in large part a product of the probable future in which its consequences will play out. Just as any given expense will loom larger for an individual with meager resources than for an individual with abundant resources, so too will any current setback loom larger for an individual with poor prospects than for an individual with excellent prospects. Accordingly, in order to gauge the meaning of an event, individuals must be able to predict their probable future prospects independent of that event. Such a forecast must then be updated with each passing event, and yet this updating must be buffered, as long-term prospects are best determined on the basis of long-term experience.

An organism's local environment often remains relatively stable over the course of its lifetime. The task of predicting the future can thus be seen as derived from the larger task of learning what sort of a world it is that one inhabits.<sup>10</sup> The optimal way to identify the principal stable characteristics of one's environment, those which will best predict the future, is to sum past experience. The longer and more inclusive this summation, the more likely it is that dominant trends or features of the local environment will be distinguished from uncharacteristic chance events, and hence the more accurate any resulting forecast is likely to be. We can thus expect decision making organisms to possess some means of tallying experiences in order to learn what sort of world they inhabit. This process establishes a baseline from which the meaning of any ongoing event is derived. In turn, as immediate events pass into past experiences, they are incorporated into the continuing construction of the portrait of the local world.

Earlier, I described Shame as the subjective marker of social failure. The above discussion suggests that the degree to which individuals identify an event as constituting such a failure should be contingent on past experience. Consistent with this perspective, clinical evidence indicates that interindividual differences in the ease with which Shame is elicited are largely the product of differing life histories (Lewis 1987). Significantly, successes and failures seem to have a cumulative effect -- repeated (and early) failures lower the Shame threshold (Miller 1985). Moreover, both clinical and experimental results indicate that the propensity to experience Shame is negatively correlated with self-esteem (Retzinger 1991; Miller 1985). Self-esteem can be conceptualized as the generalized assessment of self as relatively successful or unsuccessful, a summation of the events which constitute Ego's self-perceived successes and failures to date.<sup>11</sup> Self-esteem influences whether events are seen as constituting relatively greater or lesser successes or failures, and it is this which determines the ease of elicitation of Shame. In turn, because Shame affects the salience of risk and benefit during decision making, by setting the threshold for experiencing Shame, self-esteem indirectly determines the likelihood that benefit will be maximized or risk will be avoided. Self-esteem thus operates to create a consistent situation-sensitive strategy, linking life experience to immediate decisions. For illustrative purposes we can

represent two polar cases as follows:

*poor performance to date -> low self-esteem -> low Shame threshold -> more frequent Shame experiences -> more frequent use of benefit maximizing strategy*

VERSUS

*good performance to date -> high self-esteem -> high Shame threshold -> less frequent Shame experiences -> more frequent use of risk avoiding strategy*

Because both social position and social acceptance are determinative of fitness, the motivational system which regulates risk taking decision making in light of future prospects should be sensitive to each of these factors. We have already seen that Shame, the most proximate component of the system, can be elicited by either subordination or audience disapproval. Correspondingly, self-esteem, the modulator of Shame, is determined both by one's relative social standing over time (Barkow 1989) and by one's history of social inclusion or exclusion (Leary and Downs 1995).<sup>12</sup> In broad evolutionary terms, a proclivity for risk taking can be understood as an adaptive preference for immediate resources and reproductive opportunities, a preference that is itself the product of early life experiences which conveyed the message that the local environment is unfavorable and/or unpredictable (Hill, Ross, and Low 1997).<sup>13</sup> I suggest that, together, self-esteem and the Shame/Pride constellation constitute the evolved psychological mechanism whereby such adaptive preferences are determined and instantiated in humans.

In contradiction to the pattern proposed above, a large body of research indicates that individuals with low self-esteem tend to be conservative, avoiding situations which might expose them to negative feedback, while those with high self-esteem are more adventurous, seeking out opportunities to exercise their talents. Note, however, that such strategies involve choices which are made far in advance of action -- when it is possible to make decisions in anticipation of particular emotions rather than under their influence, risk avoidance is adopted by the very same individuals who are most prone to experience Shame, the emotion which creates an indifference to risk. The influence of self-esteem is thus paradoxical -- low self-esteem leads to both advance risk-avoidance and spontaneous risk taking. This paradox may be indicative of the imperfect nature of the system. Because each adaptation is a response to particular selective pressures, there is no intrinsic reason why adaptations will be completely complementary with one another. Instead of viewing organisms as perfectly integrated wholes, it is best to see any given adaptation as functioning within an environment which is in part composed of the other features of the organism. Hence, while selection will preclude adaptations which consistently interfere with one another, compromises may occur in cases where different adaptations are each sufficiently valuable, and sufficiently disparate from one another, that the costs incurred when they occasionally interfere with one another are outweighed by the benefits accrued when they are able to function independently. In the present case, on the one hand, it is often adaptive to be able to plan actions using complex multi-stage extrapolations into the future. On the other hand, it is also adaptive for failure to be experienced as aversive, and for failure to lead to a devaluation of future prospects and a discounting of risk. However, these two types of adaptations may

sometimes interfere with one another -- the human ability to play out scenarios far in advance can undermine the adaptive influence of emotions. From the perspective of maximizing fitness, individuals with a history of failure should seek out, and seize, every opportunity for advancement. However, humans, able to see far down the road, and having learned how painful failure can be, may cautiously avoid such opportunities long before they arise. Note, however, that this evolutionarily counterproductive approach operates only when behavior is influenced by the anticipation of emotion, rather than by emotion itself -- when dramatic, future-altering events occur, actual emotions are elicited, and these are often able to override the strategies developed through cognitively complex anticipatory planning. Hence, the interference of long-range extrapolation with the adaptive functioning of self-esteem fades when critical turning points arise.<sup>14</sup>

### **PATTERNED DIFFERENCES IN RISK TAKING**

Earlier, I noted that Daly and Wilson have argued that impulsive aggression should be most likely to occur among young males, as, in the environment in which humans evolved, young males had the most to gain, and the least to lose, from such behavior. Indeed, this reasoning pertains to all forms of risk taking, a prediction supported by insurance statistics on young males' involvement in accidents (Gardner 1993). We can account for this pattern in terms of the proximate mechanisms described above, as follows: Sexual maturation is accompanied by a profound change in Ego's position in the social structure. Unlike the child, the adolescent is evaluated according to many of the same standards of skill, attractiveness, and social facility which are applied to adults. Given the adolescent's lack of experience in the larger adult arena, it is inevitable that even a relatively successful adolescent will experience more failures than was true earlier in life. Hence, we can expect that adolescents as a category should suffer reduced self-esteem, and should experience Shame more often than either children or adults, and there are some indications that this is the case (Reimer 1996). As time passes, a social sorting out occurs such that an individual's life trajectory is likely to stabilize, with a corresponding stabilization in self-esteem and a decrease in emotional oscillations. As a consequence, for all but the least successful individuals, risk taking declines. This change is also adaptive, as accumulating successes decrease the uncertainty of the future, with the result that risk taking becomes increasingly unattractive (Gardner 1993).

Gambling with one's life is largely the domain of young males. This is in keeping with the higher variance in reproductive success among males than among females, and hence the higher stakes to be won or lost in social competition -- in our evolutionary past, for males, the issue was whether or not it would be possible to mate; for females, the issue was whether or not it would be possible to mate well. Accordingly, the same developmental logic which makes increased risk taking rational for adolescent males applies to adolescent females as well, but females should gamble with their reproductive resources, rather than with their lives. Consistent with this perspective, we see an increase in female risk taking behavior at adolescence, with many of the actions taken involving sexual or other adventurous behaviors which, while potentially putting

future social and reproductive progress in jeopardy, do not carry the same risk of death as many male pursuits. Furthermore, like males, females are subject to the life history logic which, in the past, made dramatically increased risk taking rational for those individuals who, having a troubled background, were likely to possess poor future prospects as well. Consistent with this view, girls who have a history of victimization and deprivation suffer from low self-esteem and, upon reaching adolescence, become sexually active sooner, and become markedly more promiscuous, than girls with a history of stable, caring family relationships (reviewed in Belsky, Steinberg, and Draper 1991). Hence, the same Shame/self-esteem system seems to influence the salience of risk and benefit in both males and females, although sexually dimorphic mechanisms which are beyond the scope of this paper regulate the content, rather than the relative degree, of risk taking.

### **THE NEUROCHEMICAL BASIS OF SELF-ESTEEM**

If the system posited above is an evolved adaptation, we can expect to find an underlying species-typical physiological correlate. Recalling that the roots of this system predate human cognitive complexity, we begin first with nonhuman primate models. Experimental manipulations in primates reveal that adverse early experiences result in sub-normal levels of brain serotonin, a neurotransmitter (Rosenblum et al. 1994). In rhesus monkeys, low serotonin levels predict early death or disappearance (Higley et al. 1996). Young males with low serotonin are more likely to “initiate . . . aggression, often at inappropriate targets such as high-ranking subjects or much larger adult males, and once aggression has started, it is more likely to escalate to injurious intensity,” (ibid:542). Such males are also more likely to risk their lives in other ways, such as repeatedly entering baited traps (ibid.). In keeping with the position that a) risk taking should be inversely proportional to future prospects, and b) rank is a principle determinant of future fitness, dominant adult male vervet monkeys have nearly double the concentration of blood serotonin of subordinate adult males, and changes in rank are accompanied by corresponding changes in serotonin levels (Raleigh et al. 1984).

In humans, there is an inverse correlation between adverse early experience and the density of serotonin receptors (Pine et al. 1996). A sizable body of clinical evidence supports a strong connection between subnormal serotonergic activity and impulsivity, including impulsive aggression (Coccaro 1989). Relatedly, consider the subjective and physiological correlates of depression: Depression is associated with an assessment of the self as worthless, and Shame appears to play a central role in the disorder (Lewis 1987). Contrary to conventional portraits of depressives as passive, depression can be associated with significant anger (Fava et al. 1993) and even homicide (Malmquist 1995), and is notably linked with pathological gambling, sexual compulsions, and other impulse control disorders (Hollander and Wong 1995), behaviors which exemplify the risk indifferent/benefit maximizing bias that Shame induces. Likewise, depression is a precursor to suicide, a behavior which can be viewed as a maladaptive extreme outgrowth of insensitivity to risk: Suicidal individuals are generally blind to the fear of suffering and death which others feel, and instead focus solely on how their deaths will solve a multitude of problems.<sup>15</sup>

Depression in general, and suicidality in particular, are associated with inadequate serotonergic activity, and pharmacological interventions which effectively increase such activity are the principal means of treatment.<sup>16</sup> These same therapies mitigate both associated anger attacks (Fava et al. 1993) and the impulse control disorders noted earlier (Hollander and Wong 1995). Taken together, the above findings suggest that serotonergic activity is involved in the tracking of experience, the adjustment of risk taking behavior, and the generation of affectively-laden assessments of self. At present it is unclear exactly how serotonergic activity maps onto subjective experience. However, since significant changes in serotonin levels apparently occur over a period of hours, days, or weeks, rather than seconds, it is likely that serotonergic activity is more closely linked to the experience of self-esteem than to the experience of those emotions which both contribute to and are modulated by self-esteem.

While the nuanced subjective manifestations of human serotonergic activity are doubtlessly related to our neural complexity, it is worth noting that serotonin levels appear to be linked with dominance in a variety of vertebrates.<sup>17</sup> Furthermore, because evolutionary processes generally operate through modification rather than innovation, it is likely that this system predates even the relatively unsophisticated social behavior characteristic of dominance relations in these animals. In all creatures, be they social or not, a prerequisite for reproduction is survival, and a prerequisite for survival is food. Serotonin is endogenously constructed using tryptophan, an amino acid derived from dietary sources. Accordingly, reduction in food consumption (indirectly) causes decreases in levels of available serotonin. Consistent with the role described above for serotonin, in humans, birds, and, I suspect, all vertebrates, food deprivation results in increases in impulsivity in general, and in impulsive risk taking in particular (cf. Keys et al. 1950; Fachinelli et al. 1989). Hence, it appears that a primitive decision-making function of the serotonergic system is the calibration of risk taking in light of future prospects calculated on the basis of recent food availability. Apparently, as sociality evolved, social position was added to food availability as an index of future prospects. The evolution of hominid cooperative behavior thus probably involved the addition of a third layer, the regulation of risk taking in light of social acceptance, to an already ancient system.

## **IMPLICATIONS**

Like the villagers in Bengkulu who sought to explain Rustam's murder, observers the world over are quick to note the correlation between an actor's emotional state and the action taken. Moreover, such explication is not limited to others' behavior, for individuals often retrospectively explain their own conduct with reference to the emotions experienced at the time ("I did it because I was mad," etc.). Although it is likely that such analyses are often ultimately correct, they nevertheless dichotomize decision making as either influenced by emotion, or not. However, given emotion's central role as the motivator of action (recall the discussion of 'drives'), it is unlikely that normal individuals are ever completely free of the influence of emotion: Victims of brain injuries which interfere with emotional experience become catatonically apathetic -- they make no decisions, in part because no option appears any better than any other option (cf.



Damasio & van Hoesen 1983). Nevertheless, it is important to distinguish between the more generalized motivational role of emotions as goals/anti-goals and those specific influences on decision making which particular emotions exercise when they are elicited.

The powerful influence of active emotions on decision making is often visible only to observers or in retrospect -- at the time, we do not experience some options as highlighted by a given emotion, we experience them simply as self-evidently better.<sup>18</sup> This is not an accident. For several reasons, the transparency of emotional biasing enormously augments emotions' power to shape behavior. First, by making some options appear obviously better, rather than merely better-in-light-of-how-you're-feeling-now, the transparency of emotions' influence facilitates decision making, since anything which introduces ambiguity at critical junctures delays the process and lessens the certainty of the outcome. Second, as we saw in the discussion of self-esteem, transparency is particularly important in a complex creature capable of both remembering distant suffering and planning far into the future. From an evolutionary perspective, the final objective in all decisions must be fitness, not the avoidance of suffering. Relatedly, in many situations maximizing fitness may require forsaking short-term gains in favor of long-term benefits. If emotions were unable to both powerfully and transparently dictate the biasing of options, organisms might often make choices which were in their personal, and/or short-term, best interests, but not in their genetic, and/or long-term, best interests (cf. Frank 1989). An individual with poor prospects would be ill-served by an emotion which either a) only weakly highlighted the benefits to be gained by risk taking, or b) strongly highlighted those benefits, but did so in a fashion whereby the source of the highlighting was evident. Presumably, in the distant past some young males, upon being humiliated by their rivals, were able to see beyond experiences of Shame and anger to the agony which conflict or other dramatic action might entail. These farsighted individuals did not take risks, did not gain glory, and did not pass on to us the genes for such attenuated emotions. Likewise, presumably, in the distant past some young males were tempted to take risks in such situations, but were able to recognize that their impulses arose from ephemeral emotional states, and hence they refrained from acting. These introspective individuals did not take risks, did not gain glory, and did not pass on to us the genes for subjectively opaque emotions. We are the descendants of those for whom emotionally-induced biases were both compelling and transparent.

Our emotional inheritance shapes our decisions on a daily basis. Are our decisions more rational, in the economic sense of maximizing utility, or less as a consequence of this influence? The answer depends on several factors. First, as I have argued throughout this paper, emotions are premised upon discrete utilities which include both the overarching ultimate goal of fitness maximization and a specific proximate goal, such as rank striving, whereby the former is served. Importantly, these utilities may differ from those which an individual consciously holds when not experiencing a given emotion state. It is this discrepancy which has led many philosophical traditions to view emotions as 'irrational,' since emotions may result in behavior which is counterproductive from the perspective of self-consciously formulated personal agendas. Hence, emotions may often be economically rational only in light of the change in utilities which they themselves entail (of course, this qualifier is not needed when emotions lead to behavior which is congruent with personal agendas, as when an angry and humiliated football player, indifferent to

risk, successfully completes a daring play). Second, even if we limit our evaluation of economic rationality to those utilities which emotions are premised upon, emotions may still result in irrational decisions as a consequence of the discrepancies between our current world and that in which the emotions were designed to operate. Shame and anger led Rustam and his rivals into violent conflict despite the fact that the 'winners' of the confrontation gained only imprisonment. Had they been members of a small, acephalous band of foragers, rather than citizens of a nation-state possessing a designated police force and judiciary, their actions might have resulted in heightened social position and the preclusion of future transgressions.

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<sup>1</sup> This paper presents my own speculations on shame and pride and, more broadly, on the relationship between emotion and decision making. Space constraints preclude extensive citation -- for a review of the literature on the latter topic, watch for a forthcoming publication from Jennifer Lerner and George Lowenstein.

<sup>2</sup> The influence of emotion on memory may operate via a labeling process wherein the emotions associated with events constitute tags which facilitate both storage and retrieval, a possibility which is supported by the key role which the limbic system plays in learning (cf. LeDoux 1996).

<sup>3</sup> In addition to constraining choices to a given category of outcomes, some emotions may also affect decision making by placing constraints on the search process which evaluates and/or generates choices. It seems likely that emotions such as fear and anger lead individuals to evaluate only a small number of options that address the given task, and to choose the first option evaluated which does better than previous options on the central criterion (cf. Todd, other authors, this volume). This effect would be consistent with the time urgency associated with these emotions. In contrast, however, some emotions seem to lead to the extensive review of a wide range of options which could address the given task. For example, although Gigerenzer (this volume) and others have noted that romantic love leads to a cessation of the search for a mate, at another level of analysis, a hallmark of romantic love is obsessive evaluation of a wide variety of means whereby the individual might attract and retain the prospective partner. A similar preoccupation with the evaluation of multiple possibilities seems to also characterize grief. In both cases, the particular relationship with the world marked by the emotion is such as to demand efficacy rather than rapidity in the response (in the case of grief, efficacy can be defined in terms of the prevention of future losses of the same type, i.e., the review of possible pasts is a learning process which benefits future action). Hence, it appears that to understand the effect of an emotion on the evaluation of options within the given domain, we must first consider the type of situation which the emotion is designed to address.

<sup>4</sup> Throughout this paper the term 'Ego' is used in the anthropological sense (i.e., the focal actor in the given discussion), and not in the psychological sense (i.e., a component of mind).

<sup>5</sup> J. Lerner and associates have recently demonstrated that, relative to others, individuals who are prone to anger tend to discount the likelihood of negative outcomes (J. Lerner, personal communication).

<sup>6</sup> I include modifications of gait in this category. The bent-kneed, shuffling gait reduces an individual's apparent size. However, it is not clear that the stiff-legged gait increases apparent size. Instead, the stiff-legged gait may be a consequence of Darwin's principle of antithesis, i.e., it may simply be a way of making it clear that one is not bending one's knees (J. Moore, personal communication).

<sup>7</sup> Some forms of submissiveness involve active attention-getting, as in posterior presenting among many primates and 'reassurance-seeking' among chimpanzees. However, this does not detract from the observation that avoiding attracting attention is often a way of being submissive.

<sup>8</sup> Economic analysis can also be applied to blushing, the only part of the Protoshame display for which there is no opposite in Protopride: Consider individual *A* who, through his behavior, claims superiority over individual *B*. For *A*, following up on the claim to superiority through actual aggression entails the costs of the energy and risk involved in the conflict, but promises the benefit of definitively achieving the superior position. In contrast, for *B*, who acknowledges his own inferiority, conflict entails the costs of expended energy and exposure to risk (where the latter is likely to be greater than for *A*, yet there are no probable benefits. Accordingly, *A* should be willing to engage in conflict, while it is in *B*'s best interests to ensure that conflict does not take place. *A* should be happy to forgo the costs of conflict if he can be certain that *B* acknowledges his superiority. However, *B*'s assessment of their respective positions can only be communicated via behavior, and behavior is susceptible to manipulation. The potential for manipulation is high in Protoshame, as gaze, posture, and visibility are factors which are easy for mammals to control. For *A*, this means that *B*'s signals are not as reliable as physical victory. Hence, even when *B* behaves in a subordinate manner, *A* may suspect a ruse, and attack anyway. From *B*'s perspective this makes the Protoshame display a risky enterprise, for, as is true of many submissive behaviors, the display

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makes it difficult for *B* to defend himself. What *B* needs in order to preserve the utility of the display is an additional signal which is unequivocal (or 'honest'), one which *A* can accept as indicating his definitive superiority, and which therefore obviates the need for conflict. In order to be unequivocal, the additional signal must be involuntary. To be useful, the signal must be conspicuous so as to ensure that *A* notices it. Blushing fulfills both criteria admirably. Critics might object that blushing is difficult to see in people with very dark skin, and early hominids, living in an equatorial climate, undoubtedly had dark skin. However, many present-day equatorial peoples have skin which is not so dark as to prevent visible blushing, and it is quite possible that the same was true of early hominids. Lastly, this argument suggests that, across species, honest signals should be more common in appeasement displays than in threat displays. The specific phylogenetic roots of blushing, however, have yet to be investigated.

<sup>9</sup> In addition to labeling the eliciting social condition, *humiliation* also refers to feeling-anger-because-Other-made-Ego-feel-Shame. However, rather than being a discrete emotion produced by selection, this experience is an inevitable consequence of a) the nature of Shame as a self-informing index of social standing, and b) the relationship between rank and access to subjectively valued resources.

<sup>10</sup> More broadly, behavioral and developmental plasticity are contingent on the ability to identify the particular circumstances characteristic of one's own surroundings, in contrast to the generic circumstances characteristic of species-typical surroundings.

<sup>11</sup> Note that this formulation does not entail the formidable task that Ego store discrete records of all of her life experiences. Rather, self-esteem can be thought of as a running tally, with new experiences simply modifying the existing measure without necessarily being stored as independent records. Relatedly, because successes or failures are subjectively experienced via Shame or Pride, we can think of self-esteem as the net impact or residue of all Pride-eliciting events minus the net impact or residue of all Shame-eliciting events.

<sup>12</sup> In a number of publications Leary and his associates argue that self-esteem is both a trait (i.e., relatively stable over time) and a state (i.e., elicited by ongoing events). I suggest that state self-esteem is the cognized or articulated facet of an individual's current emotional state, particularly with regard to those emotions, such as Shame and Pride, which revolve around self-assessment.

<sup>13</sup> Hill et al. argue that this preference is the product of a set of beliefs about how predictable, and how favorable, the future will be. This approach is congruent with some ethnographic findings. For example, in describing the violent conflict associated with the "street" culture of a poverty-stricken U.S. inner city, Anderson notes that "the most fearsome youths . . . are uncertain about how long they are going to live and believe they could die violently at any time . . . nothing intimidates them," (1994:94). However, the ethnographic literature also supplies many examples which are contrary to Hill et al.'s emphasis on cognitive schemas -- Lightfoot's (1997) affluent young suburban informants risk their lives behind the wheel despite being quite optimistic about their futures. Moreover, Anderson himself explains the "street" proclivity for violence not with regard to conscious calculations about the future, but rather in terms of attempts to protect and increase self-esteem. It appears that conscious beliefs about the future influence, but do not wholly determine, the relative salience of risk or benefit. Hence, although Hill et al. take account of a number of personality factors, the authors overemphasize the contribution of abstract beliefs in decision making. This may be due to their methodology, as they rely entirely on questionnaires, yet, because decision making is importantly influenced by emotion, measures which are removed from real-world social interaction may not fully reflect actors' actual proclivities. Analogously, in assessing self-esteem investigators must be careful to distinguish between actual self-assessment and patterned self-presentation, particularly as individuals who occupy unstable worlds may adopt an aggressively positive self-presentation as a tactic to avoid exploitation (cf. Anderson, *ibid.*).

<sup>14</sup> In contrast to the prevailing opinion in psychology, which holds that low self-esteem is linked with violence, Baumeister, Boden, and Smart (1996) have argued that this is true of *high* self-esteem. As is often the case in such debates, both perspectives are correct. The authors point out that when an individual with high self-esteem experiences an event that is dramatically incongruent with his positive image of self, he is likely to resort to drastic action to try to compensate. We can understand this pattern as follows: A significant difference between persons with high and low self-esteem is the interpretation of events -- whereas persons with high self-esteem are likely to interpret events in a manner which portrays them as successful or blameless, those with low self-esteem are likely to interpret events as reflecting poorly on them. These tendencies influence the probable frequency and character of Shame experiences. A person with high self-esteem will only experience Shame when his failure is a dramatic and incontestable one -- any smaller or more ambiguous failures are likely to be reinterpreted in such a fashion as to preclude Shame. High self-esteem individuals will therefore experience Shame relatively rarely, yet, in those instances when they do experience it, the Shame will be extremely intense. Because the degree to which benefit is focused on and risk is ignored is a function of the intensity of Shame, this means that when high self-esteem individuals feel Shame, they will dramatically pursue big-stakes gambles. In contrast, individuals with low self-esteem will frequently experience Shame, sometimes at a low intensity, sometimes at a high intensity. Accordingly, they will more frequently adopt a benefit-maximizing strategy in

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critical situations. Charted across the lifetime, we can therefore expect pervasive but fluctuating impulsive risk taking from those with low self-esteem, and much more sporadic, 'out of character' bursts of impulsive risk taking from those with high self-esteem. Because much violence is a form of impulsive risk taking, we can thus expect a greater lifetime total of violent acts from individuals with low self-esteem, while individuals with high self-esteem may occasionally erupt in an explosive fashion.

<sup>15</sup> Presumably, this 'design flaw' in Shame-induced risk indifference has persisted because there is little pressure to correct it: Imagine a mutation which modified Shame by adding the qualifier "take desperate measures, but stop short of killing yourself." Because this mutation would only come into play in those extreme circumstances in which Ego had failed profoundly, the individuals whom it would save would be those with the least likelihood of passing on their genes. Furthermore, to the extent that such a ceiling on risk indifference precluded engaging in life-threatening but potentially fitness-enhancing behavior, such individuals would be less likely to be able to improve their fitness prospects. Accordingly, the mutation could occur and die out repeatedly, with the result that most individuals at any one time would lack this safety feature.

<sup>16</sup> A prominent psychologist told me that, in his own experience, taking Prozac, a serotonin-specific antidepressant "diminished the gap between who I am and who I want to be," i.e., it increased his sense of self-worth.

<sup>17</sup> The picture here is somewhat complex, as it is unclear to what degree the aggressivity associated with dominance and high levels of serotonin in non-mammals can be equated with the *impulsive* aggression characteristic of mammals having low levels of serotonin.

<sup>18</sup> Given the often conflicting goals of different emotions (love and anger, for example), the surprise is not that we sometimes seem to deviate from a consistent set of values or objectives, but rather that we are ever able to experience ourselves as consistent at all!

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