



SOCIAL COMPARISON, SOCIAL ATTRACTIVENESS AND EVOLUTION: HOW MIGHT THEY BE RELATED?

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Abstract — Social comparison occurs in many forms of interaction. Despite a voluminous literature, the link between human and non-human forms of social comparison has rarely been made or explored. In this paper we consider the evolution of the competency to socially compare self with others and point to its long phylogenetic history. Special regard is given to intrasexual selection, competition for parental investment, and reciprocal exchange. The evolved competency to socially compare has been important in two separate and mutually incompatible forms of social competition, based on displays of either intimidation or attractiveness. This has resulted in two self-concepts which have been called resource-holding potential (RHP) and social attention-holding power (SAHP). These primitive self-concepts derived from social competition may have been stages on the phylogenetic pathway to human self-esteem. It is suggested that an evolutionary approach adds a new dimension to current theories of social comparison.

Social comparison has a long history in the literature. It is 40 years since Festinger's (1954) landmark paper highlighting social comparison as a key variable in social relating. Wheeler (1991) has reviewed this history and the waxing and waning of interest in social comparison. Over the years research has shown that social comparison is ubiquitous in social relating, both between individuals (Wood, 1989) and groups (Pratto *et al.*, 1994; Sidanius, Pratto & Bobo, 1994), and that the reasons people socially compare themselves are many and various (Suls & Wills, 1991). Social comparison can be concerned with estimates of relative social rank (inferior-superior, weaker-stronger, upwards or downwards), and similarity-difference (Furnham & Brewin, 1988; Gilbert, 1992; Pratto *et al.*, 1994). Social comparison can be used to self-enhance, self-improve and decide whether to challenge or submit in conflict situations. We will not review that voluminous literature here (but see Suls & Wills, 1991; Wood, 1989) nor explore directly the literature linking social comparison with psychopathology (Furnham & Brewin, 1988; Gilbert & Trower, 1990; Swallow & Kuiper, 1988) and stress (Buunk & Hoorens, 1992). Rather we wish to explore a potential approach to social comparison research and theory, derived from evolution theory. We suggest that the ability to compare self with others is phylogenetically very old, biologically powerful, and is recognizable in many species. This observation has largely been ignored in the literature so far. That humans socially compare in more complex ways than other animals is undisputed,

but the power of social comparison to inhibit or facilitate social behavior, and its linkage to psychopathology, may result from the circumstances of our evolution.

SEXUAL SELECTION

The theory outlined here begins with an exploration of evolution theory to set the context. Darwin (1871) pointed out that, alongside natural selection, a social process was operating within species to determine which individuals in each generation reproduce and at what rate. Darwin called this phenomenon sexual selection, and subdivided it into *intersexual* selection, in which one sex *chooses and attracts* the other for mating, and *intrasexual* selection in which one sex competes with and *prevents* other members of the same sex from having free access to breeding resources (e.g. Krebs & Davies, 1993; Trivers, 1985). The implication of this hypothesis is that, in each generation, one or more social processes distribute the population along a dimension of successful rates of reproduction, i.e. those who do well (are reproductively successful) and those who do less well. Furthermore, those who are successful will show major differences in behavior compared to those who do less well.

In most mammals, reproductive success depends on social success in various roles, such as caring for offspring and forming helpful alliances, but one key role is in out-competing others who are pursuing the same resources (Barash, 1977; Gilbert, 1989; Krebs & Davies, 1993; Trivers, 1985). In primates a salient mediator of reproductive and social success is the social hierarchy. Those high in the hierarchy have more breeding opportunities and often make the more attractive allies, compared to those low in the hierarchy.

THE SOCIAL HIERARCHY

The social roles of the (relatively) successful and unsuccessful are represented in two rather different but sometimes related ways. In some species the two contrasting roles are "territory-owner" and "non-territory-owner"; in other species who live in groups they are "high-ranking" and "low-ranking." There is now considerable evidence that high and low ranking animals show differences in many domains including various behavioral differences such as explorative behavior, posture and timidity (Henry & Stephens, 1977; Harper, 1985; Kemper, 1990; Trivers, 1985). In humans, social comparison has been found to be clearly linked to assertive and submissive behavior (Gilbert & Allan, 1994). Although no longer rigidly territorial, humans do make social comparisons on the basis of territory and possessions (e.g. the size of one's house, car and bank balance, etc.).

Physiological differences between low and high ranking individuals include stress hormones (e.g. cortisol) androgens (e.g. testosterone) and neurotransmitters (e.g. serotonin) (Henry & Stephens, 1977; Kemper, 1990; McGuire, 1988; Sapolsky, 1989, 1990a,b). However, as Kemper (1990), Raleigh *et al.* (1984) and Hartmann (1992) note, physiological changes are often the consequence of rank changes not the cause. Testosterone, for example, can rise following success at non-aggressive competitive games like chess (Kemper, 1990). On the other hand, in established ranks, drug effects seem to be mediated via rank. Harber, Barchas and Barchas

(1981) found that in rhesus monkeys given amphetamine, dominant animals increased their threat, chase and attack behaviors, while subordinates increased their submissive behavior (e.g. fear grimace and turning away). These were independent effects from separate groups and not the result of the dominant animals threatening more and subordinates submitting more. Nevertheless, the finding that physiology tends to follow rank changes rather than cause them suggests that there is some process preceding social contests that determines whether or not an animal will challenge another(s), or refrain from doing so. Moreover, in humans, judgements of rank and dominance are made very quickly (Kalma, 1991).

RITUAL AGONISTIC BEHAVIOR

To be socially successful, a key issue centres on an animal's ability to operate some kind of internal cost-benefit analysis. Thus, for example, in competing with others it is important that an animal does not continually compete and challenge those who will always defeat it; this would be to risk injury and waste energy. On the other hand, it is important to challenge those who can be beaten in order not to miss out on opportunities which could be available. As we shall argue shortly, social comparison may help in this cost-benefit analysis by making it possible to "pitch" challenges towards the optimum level of cost-benefit risk.

In the vast majority of vertebrate species the social interactions which create social rank asymmetries take the form of *ritual agonistic behavior*. This has been vividly described and photographed by natural historians, comparative ethologists and social biologists (Attenborough, 1992; Krebs & Davies, 1993; Trivers, 1985). There are a variety of signals that are used to signal intent to challenge, threaten, attack, submit and withdraw (Harper, 1985). In these highly ritualized encounters, it is necessary for the process of losing to be as ritualized as the fighting. In this context a ritual submission, arising from a defeat or expectation of a defeat, operates a process of internal inhibition which induces the loser to keep the rules, and to be no more of a threat to the winner than if he had been killed or severely injured in mortal combat (Price & Sloman, 1987; Price *et al.*, 1994). Moreover, for a time at least, subsequent threat signals from the winner will automatically trigger submission from the (earlier) loser.

It is as if there is a kind of an internal referee which (en)forces the loser to behave like a loser and refrain from fighting back or making claims on reproductive resources that challenge the winner. In this way a status hierarchy emerges from the preparedness of the winner to threaten and the loser to submit (Price, 1988). Without this internalized substitute for an external referee (i.e. without this internal inhibition of challenging behavior), the ritual or "game" of agonistic behavior would not be effective. Hence, winners do not have to kill competitors, nor continually prevent losers from challenging for resources on (say) a day to day basis, which would lead to perpetual conflict and fighting. Rather, losers signal via their nonverbal behavior that they are in a no-challenge, inhibited state of mind. We suggest that this internal referee is controlled by social comparison. Dominance, however, is a complex concept, that defines relationships rather than individuals, and social hierarchies are not necessarily linear (Dunbar, 1988).

When the relative pay-offs of alternative strategies depend on the behavior of other actors, game theory provides an appropriate model. Using this approach, Maynard Smith (1982) has compared what he calls a hawk strategy, characterized by an escalation of agonistic encounters, with a dove strategy which is characterized by *de-escalation (giving in)*. He has demonstrated in his evolutionary model that, given certain conditions, a pure hawk strategy is not "evolutionarily stable", in that it can be infiltrated by a mixed hawk and dove strategy. In this model it is assumed that in encounters between hawk and dove, the hawk has the higher pay-off, in terms of survival and reproduction. However, when hawk meets hawk, the pay-off is lower because of the risk of escalation to unritualized combat with consequent serious injury or death. Submitting ensures the loser survives. From our point of view this is another model which has shown the evolutionary adaptiveness of having internal systems that allow the individual to escalate or de-escalate according to evaluated chances of success or failure.

THE ROLE OF SOCIAL COMPARISON AND RHP

What is the role of social comparison in these interactions? Although animals may continually test out the strengths of each other (and this can be from a very early age as in rough and tumble play) (MacLean, 1985), it also seems to be the case that animals can work out comparative (self-other) differences sufficiently competently to avoid gross mismatches of strength and ability. Thus, before animals even get into damaging/losing situations one may signal to another that they recognize they are weaker or not in a challenging state of mind and therefore need not be attacked or challenged. Hence, some judgement of relative probabilities of making a successful challenge has taken place. This depends on social comparison which has a very long phylogeny.

Focusing on agonistic behavior, social comparison can be described in terms of a self-concept which has been called resource-holding potential, or RHP (Parker, 1974, 1984). RHP is an intervening process which allows an estimate of fighting capacity and the probability of making a successful challenge or successfully defending against other challengers. On the input side it is defined by size, strength, skill, previous success, weapons, allies and other factors that increase fighting/winning capacity; on the output side it is defined by the probability of attack (as opposed to escape or submission) when challenged. There is a basic social evaluation process which is responsible for making the comparison between "own RHP" and the RHP of a potential adversary and follows the rule "submit to those stronger, challenge those weaker" (Krebs & Davies, 1993).

At its simplest, the output from this system is either "favorable relative RHP" which means that the individual evaluates him/herself to be more powerful than the rival, or "unfavorable relative RHP" which means that the individual evaluates him/herself to be less powerful than the rival (Price, 1988). The "favorable relative RHP" output takes the form of threat, attack, or other escalating forms of agonistic behavior; the "unfavorable relative RHP" output takes the form of flight, escape, submission, or other de-escalating forms of agonistic behavior. Usually, in an encounter between two individuals, there is a clear difference in RHP, and the one who makes an evaluation of "unfavorable relative RHP" backs off. If both make an

evaluation of "favorable relative RHP", there is a pair-wise contest or fight, and the loser suffers a fall in RHP, so that next time they meet there is a difference in RHP, and the loser will submit or back off.

In this way the variance in the individual estimates of RHP in the population is increased, and the frequency of fighting is reduced (i.e. some members will estimate they have high RHP and can challenge for and defend resources, while others estimate they have low(er) RHP and reduce or inhibit their challenging behavior). All the phenomena of ritual agonistic behavior can be described in terms of signals of either absolute or relative RHP. Ritual agonistic behavior can then be conceptualized as an RHP management system, the objectives of which are to rank the population in terms of RHP, and also to increase the variance of RHP in the population. In this way the population is spread out along the dimension of successful/unsuccessful in terms of reproductive success and access to resources that facilitate reproductive success.

RHP AND SELF-ESTEEM

Probably the nearest we can get in human terms to the concept of RHP is self-esteem (Wenegrat, 1984) and it is possible that self-esteem evolved out of the social comparative components of RHP. Personal estimates of RHP (the ability to make successful challenges for resources and defend resources from other challengers—competitors) remain important components of self-esteem. Thus, in humans, self-esteem may fall with loss of reproductively useful resources (loss of mates to a competitor, loss of allies, failing to be chosen to gain a position within society that goes with control over resources, or having one's actions controlled by a more powerful other that limits personal exploration and acquisition of resources). This would explain two aspects of self-esteem which would otherwise be puzzling: its global nature (overall rating of the self along one single dimension of "value") and the great variation in self-esteem in the population; both these features are essential to the function of RHP in regulating ritual agonistic behavior. Clearly, this is sharpest in situations where resources are in short supply or where there is intense competition. Indeed, it does seem to be the case that the rates of ritual agonistic behavior are related to the shortage of resources and density of predators (Power, 1991; Van Schaik, 1989).

If we now substitute self-esteem for RHP, and also adopt the current ethological practice of regarding behavioral variation as alternative strategies, we can formulate our hypothesis in terms of RHP. Thus, *social comparison is an ancient ability that functions as a challenge and confidence regulator*. Hence, a self-enhancing social comparison is also a confidence boosting one.

BREEDING AND DEVELOPMENTAL STRATEGIES

Dunbar (1988) has pointed out that breeding success must be estimated over the life time of an animal. Animals who have short life spans and few chances of breeding may function differently from animals who have longer life spans and a number of chances of breeding from year to year and who may achieve reproductive success in a number of ways. When life time chance is calculated it becomes apparent that there are at least two possible strategies:

(1) A high-gain/high-risk strategy which means that an animal might do very well, especially when in its prime, but could also do poorly if beaten or weaker than others. We could call this the high challenge strategy or the ambitious strategy.

(2) A low-gain/low-risk strategy that offers moderate success but extends over the breeding life time of the individual. There are a number of strategies that might be associated with low-gain/low-risk such as accepting a subordinate position and waiting to take over a harem or waiting/working with allies for help, or being sneaky and opportunistic. We might call this a low challenge strategy.

In other words it is not necessarily the case that low self-esteem and a tendency to make unfavorable social comparisons are maladaptive; rather they may reflect alternative strategies for coping in an environment where others are seen as more powerful and where the (non-conscious) preferred response is to adopt a non-challenging position to the external world. This immediately raises the question of how these strategies are chosen. Are they selected on the basis of experience? Certainly, there is evidence that self-esteem and social comparisons reflect rearing (parent-child) patterns and early peer group experiences (Coopersmith, 1967; Dunn & McGuire, 1992; McCrae & Buss, 1984). Authoritarian parenting seems to increase susceptibility to disorders involving low self-esteem such as anxiety and depression (Gerlsma, Emmelkamp & Arrindell, 1990). Also people seem to switch into a low self-esteem, unfavorable social comparison strategy as they become depressed (Price *et al.*, 1994). Thus, a low self-esteem strategy may be activated early in life and more or less dominate the internal sense of self, or it can be activated at certain times when there are experiences of being defeated, powerless and failing to meet challenges (Gilbert, 1992).

For whatever reason, some individuals appear to opt for low self-esteem and non-challenge strategies early in life and these show up in various forms, such as social anxiety, fearfulness, inhibitedness, susceptibility to separation, and proneness to dysphoria and depression (Swallow & Kuiper, 1988). Other dispositions such as neuroticism and introversion may also reflect this strategy. Recent research has shown a positive association of unfavorable social comparison and introversion at $r = .54$ in a student population (Gilbert & Allan, 1994). Others may select a high challenge strategy which shows up in more ambitious behavior, grandiose expression, needs to excel, control and subdue others, with a special sensitivity to others as potential challengers who can add to or subtract from self-esteem (hallmarks of narcissistic disorder).

RHP AND SOCIAL ATTRACTIVENESS (SAHP)

In many primates, and especially humans, status and control over desirable social outcomes are not solely obtained by agonistic behavior. In humans, status is often voluntarily bestowed in response to the display and demonstration of attractive qualities of the self. Be it in courting, getting on the football team, finding a job, and making friends, the key motivation is to be chosen/selected by others. Thus, rather than intimidating others with demonstrations of RHP, humans often attempt to demonstrate attractive and attracting attributes of themselves (e.g. their intelligence, exam passing abilities, physical attractiveness, research skills, football skills). Indeed, at times demonstrating too much aggressiveness (RHP) may be seen

as an unattractive quality, although being seen as weak and unassertive is also unattractive (Baumeister, 1982). To distinguish the “attracting display” from the threat display of RHP, Gilbert (1989, 1992) called it *social attention holding power* (SAHP). This refers to the ability to direct favorable attention to the self. Barkow (1980) and Kemper (1990) also suggest that status/prestige via attractiveness is an alternative form of status acquisition to that of aggression and threat. Hence, to be valued, chosen, admired, accepted, desired, wanted, sought out, invited, and to experience one’s company as being rewarding to others all indicate that one has (high) status in the eyes of others—one is esteemed.

By comparing self with others one is able to estimate what others will find attractive in the self (i.e. noting who is getting the attention and for what) and in comparison with others, how one should change one’s behavior to obtain favorable attention (e.g. work harder, pass exams, wear certain make-up and clothes, etc.). Fashion, fitting in, various forms of competition to win approval and positive attention, and showing off, etc., can be influenced by such comparative processes. Often, of course, one may want to fit in, yet also be a little individual and better than others. Wolfe, Lennox and Cutler (1986) saw this as a dilemma between “getting along” and “getting ahead”. Thus, social comparisons could be used to indicate whether to try harder (increase effort) or, if it is unlikely that effort will result in success, whether to search for other domains in which to compete and put one’s efforts. It follows, therefore, that social comparisons and self-esteem can vary from domain to domain, i.e. are modular. A person may only be bothered by how they look compared to others if “appearance” is a valued domain.

So the tactics of choosing where to place one’s efforts to gain status, and whom to compare with, and thus how to maintain or increase status, rely on social comparative information. Moreover, when a person evaluates that, compared to others, there is insufficient, or a fall in RHP/SAHP in a valued domain, various common defenses can be activated (Gilbert, 1992). Whereas high RHP can be maintained via receiving submission signals, SAHP is usually maintained via receiving positive signals (e.g. approval, admiration, wanted, etc.). However, they can overlap, and loss of either can activate various defensive responses such as anxiety, anger, resentment. These two alternatives are represented in Fig. 1.

Thus, a writer (seeking recognition and SAHP) who receives adverse criticism, or whose work is ignored may become anxious, angry, envious, and/or dysphoric, just as losing a fight might activate such responses. Receiving signals that one is not attractive or has done something unattractive (and thus losing SAHP) can result in shame and resentment (Broucek, 1991; Gilbert, 1992; Kaufman, 1989). Feeling that one is vulnerable to being put down by more powerful others, or losing out to them (and judgements of who is more powerful is of course a social comparison) can activate social anxiety, frustrative anger and depression.

Since high and low self-esteem people will vary in their degree of confidence, they may follow different strategies for social comparison. Baumeister, Tice and Hutton (1989) suggested that high self-esteem people tend to draw attention to their talents and abilities, while low self-esteem people go for damage limitation, self-protection and minimizing exposure of their weak points, i.e. they are shame avoidant. Wood *et al.* (1994) found that high self-esteem people lose interest in

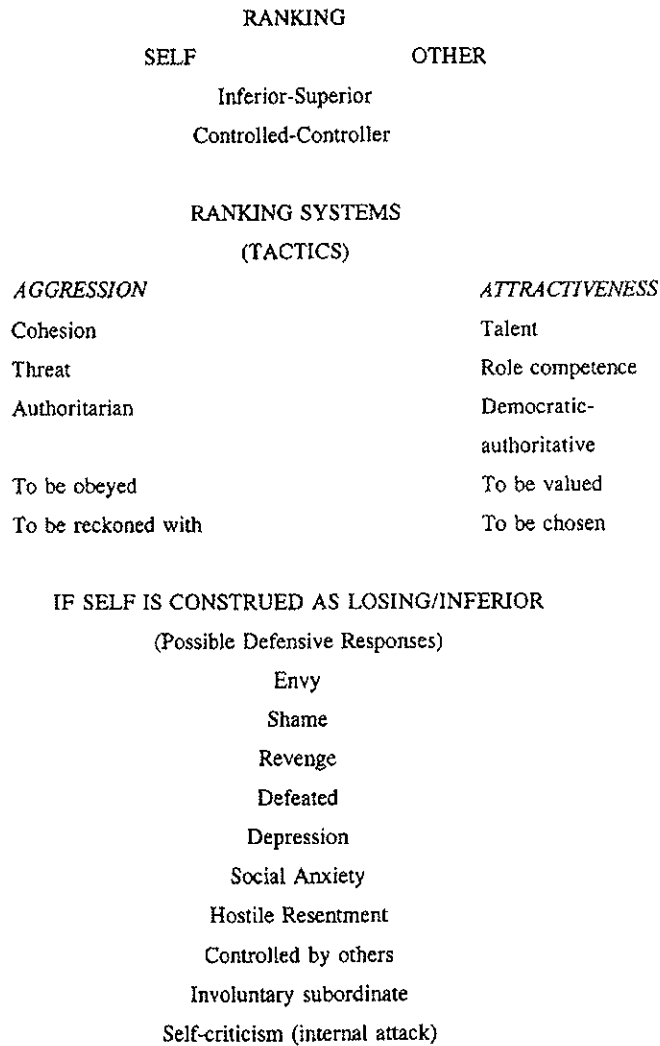


Fig. 1. Types and Tactics of Ranking Behavior.

social comparison when they succeed; that is they have little interest in comparing themselves with others who are inferior. However, low self-esteem people do seem to enjoy comparing themselves with inferior others when they succeed because it offers a "safe opportunity to revel in their success" (Wood *et al.*, 1994, p. 729). Thus, in so far as self-esteem represents internal judgements of social rank (RHP and SAHP), people who see themselves at different positions in the social rank engage in social comparisons (following success or failure) in different ways, e.g. self-enhancement versus shame avoidant.

There is also evidence that when people do more poorly than they had expected

they change their social comparison strategies, becoming more self-protective (shame avoidant), demoting the importance or relevance of the dimension/domain of their poor performance and avoiding upward comparisons (Gibbons, Benbow & Gerrad, 1994).

TRIANGULAR AND AUDIENCE COMPARISONS

Not only do we compare ourselves with others, but when seeking to make a choice (e.g. for a lover, friend/ally or select our politicians) we make comparisons between alternative individuals. And we are also aware that we, in turn, may be the target of other people's comparisons. So unlike RHP, which tends to involve pair-wise comparisons between two individuals, SAHP comparisons are more complex. They will often involve triangular relationships or larger audiences. In sexual relationships, a person may be concerned that their lover is comparing them unfavorably with another (potential or past lover/competitor). Thus, we hear questions like "do you love me more than Fred?". In other words, the person may not only compare themselves directly with Fred but also be concerned about how the other (the lover) compares them with Fred. The fear that this comparison is going badly (one is not a preferred person) can be the source of envy and jealousy (Salovey, 1991).

In the domain of sexual attractiveness there is evidence that males and females follow different intersexual strategies and compare in different ways. Males are more concerned with physical beauty while females are more concerned with power and status (Buss, 1989). It also seems that females may be more influenced by the social comparisons and evaluations made of males by female peers, especially negative judgements (Graziano *et al.*, 1993). In general, self-presentation is likely to be influenced by the social comparisons one thinks other people are making between self and others. For example, if females believe that males are selecting partners on the basis of physical beauty, then this domain is likely to be important, not only for self-presentation (leading to an emphasis on make-up, style and body shape, for example), but also self-evaluation.

Indeed, in many domains of life we not only compare ourselves to others but we invite an audience to compare us with one or more others, as in the beauty contest, political election or even at the disco. In other cases we invite the audience to compare us with some generalized standard of competence, as when a virtuoso gives a musical performance. Taking exams and going for job interviews are also examples of this. In attempting to be selected for, or fitting in with, a group (e.g. gaining employment) we not only compare ourselves to that group, but we are also sensitive to the judgements that the group is making about SAHP in the individuals it selects. Thus, selection (and thus success) is now determined not by individual action (e.g. by being stronger than a competitor or killing off the other lover) but by being able to entice the audience to choose in one's favor. Nevertheless, failure to be selected can still activate similar defensive responses to those that evolved to deal with losing pair-wise contests (e.g. anxiety, anger, dysphoria, desire to hide or get away; see Fig. 1).

It is these social comparative effects that can do much damage in situations like unemployment, because it is not the absolute levels of deprivation (which were higher in war, and are higher in third world countries) that may cause the vastly

increased rates of various forms of psychological distress in low socio-economic groups and the unemployed (Adler *et al.*, 1994). Interestingly, it does not seem to be so much the absolute levels of poverty that are associated with health indices but the distribution of inequality (i.e. degree of rank variation; Wilkinson, 1992). Thus, it may be the realization that, compared to others, one is unwanted, irrelevant, comparatively powerless, and with little of value to offer society, which may do much to increase sensitivity to psychological stressors. One patient said of his unemployment that he could not "hold his head up now," and felt he had lost his status in society. Of course, there are many other aspects to these issues as Adler *et al.* (1994) well note, but relative rank judgement is not one they explore. Unfavorable social comparisons in the domains valued by societal groups may lead some to opt out of the group and its values for judgements (e.g. academic performance) and seek out alternatives (e.g. street gangs and punk bands).

PARENTAL INVESTMENT AND SOCIAL COMPARISON

Trivers (1974, 1985) suggested an evolutionary model of child-parent interaction based on the notion that children (offspring) try to elicit high levels of parental investment in terms of energy, time and resources from care-giver(s). The child does this by various forms of care-eliciting behavior. Indeed, the ability of the child to elicit care rather than being totally passive and reliant on a parent to dispense it, is (on the whole) advantageous to the child. However, as Trivers notes, there will always be some conflict between how much investment the child tries to elicit and the amount the parent wishes to give. The way the child (and those who are interacting with him/her) learns to handle (social) disappointment and frustration may be key factors in subsequent development. Moreover, although not part of Triver's theory, sibling social comparison of how much care and attention they receive in relation to their sibling(s) can be a salient factor in the development of self-esteem.

Siblings may compete for the favorable attention and approval of the care-giver. This may be with direct conflict (e.g. at meal times arguing over who speaks first and obtains the parental attention), or more indirect, such as each child doing a painting and then asking mother which one she prefers (who has done the best). In this situation the child is inviting social comparison by the parent and making an estimate of the judgement the parent is making of each child.

The idea that siblings are getting preferential treatment from a desired other can stir up many unwanted emotions and reduce self-esteem, because it sends an unfavorable message about one's relative SAHP. This is also the domain of *favoritism*. The perceived differential treatment of siblings by parents can give rise to a host of rivalries and sibling conflicts and various attributions. Typical here are perceptions that a sibling is favored due to: gender (e.g. my brother was the favorite because my parents wanted/preferred a boy); age (e.g. I had it more difficult because I was the oldest); physical attributes (e.g. my sister was more attractive than me and got more attention); intelligence (e.g. my sister got more attention than me because she was brighter); need (e.g. my brother got more attention than me because he was a sickly/needy child) and personality (e.g. my parents preferred my sister because she fitted in with the family and its values better than me). As McConville (1985) found in free interviews with sisters, these kinds of comparison

are common. Moreover, parents may use social comparison directly to shape a child's behavior (why can't you be more like your sister/brother?). Indeed, the use of social roles models, to whom one is invited to compare oneself and copy can be used in many forms of social relating (e.g. work, sport and religion). The role model can be seen as the "favored individual."

RECIPROCAL ALTRUISM, GIVING AND RECEIVING AND SOCIAL COMPARISON

There are various models of how helping and altruistic behaviors have evolved. One view put forward by Trivers (1971, 1985) works on a cost-benefit basis. It is advantageous to help non-related kin, if in the future one can count on their returning the favor via offering support/help. However, the cost should not exceed the benefit (as in exchange theory). This implies that one central domain of social comparison will be what self is giving to others compared to what others are giving to self (Buunk & Hoorens, 1992). Recent evolutionary models of psychotherapy see this as a key dilemma (Glanz & Pearce, 1989; Slavin & Kriegman, 1992). Some patients see themselves as giving a lot to others but receiving little in return; others feel guilty about receiving more than they give. In psychology, these concerns have been described as a need to maintain equity in exchange (Burgess & Huston, 1979) and there is now clear evidence that this depends on social comparison (Buunk & Hoorens, 1992).

The theory of reciprocal altruism and exchange both suggest that humans monitor the exchange of favors and compare themselves to others in terms of giving and receiving. Caring *giving* and helping others who do not reciprocate can give the experience that the giver is deficient (need to try harder) or that the receiver is cheating and one should stop helping. Upward and downward comparisons also play a key role in help giving and the equalization of socio-economic disparities (Nagata & Crosby, 1991). When there is a recognition of disparities between self (or one's group) and others, this can stimulate efforts to reduce the disparities, maintain them or even increase them. The chosen response depends on many psychological and non-psychological factors. These may include: the explanation for the disparity, ecological factors, opportunities to be personally helpful, personal needs for the future (e.g. I can't give things away now because I might need them later), degree of relatedness and personal closeness, friend or foe, ingroup-outgroup and need for dominance. Seeing oneself in a prosperous position compared to others might enhance self-esteem but only add to a sense of superiority and the need to guard what one has, rather than a desire to help others (Pratto *et al.*, 1994; Sidanius, Pratto & Bobo, 1994).

Refraining from *seeking* help or support can arise if this lowers self-esteem, due to unfavorable social comparisons and shame—needing help is a weakness (Buunk & Hoorens, 1992; Fisher, Nadler & Whitcher-Alagna, 1982). Indeed, even revealing that one is in distress or needs help can be seen as inviting unfavorable social comparison from others. This is why many health professionals avoid revealing their own depressions and anxieties for they fear it will lead to a loss of status (Rippere & Williams, 1985). Thus, the act of asking can be seen to place the person in a lower status, one-down or dependent position. This may explain why some people prefer help to be offered rather than asked for.

FRIENDSHIP FORMATION

Cooperation and friendship formation have recently been explored using evolution theory by Argyle (1991). Trivers (1985) suggests that friendship avoids the probability of cheating (that is via comparing self with others one finds that one is giving out but receiving less back). To some extent the values (e.g. religious, social class) of social comparison that bring about the formation of alliances are socially prescribed. Nevertheless, social comparison plays a key role in terms of judgements of similarity of values, plans, goals, personality, gender and status. Both humans and primates (Crook, 1980) prefer to form alliances with those similar in status rather than with those where there are wide disparities of rank and status. In humans, age can also be a key variable. Using the SAHP model it is likely that maintaining interactions with like others will also offer clear guidelines for exchanging SAHP; that is, one can be clear about what is, and will be, valued and have SAHP bestowed upon. We suspect that maintaining a high (or optimal) rate of SAHP signals in relationships is a salient factor motivating and maintaining people in their social comparisons and preferences for like others.

Although Trivers (1985) and Crook (1980) see the avoidance of cheating as central to friendship formation, our approach suggests that maintenance (mutual support) of status and rank may be a more primary concern than cheating. This leads to the as yet untested hypothesis that in some situations, cheating and deception will cause greater disruption when it has an effect on the future flow of SAHP; that is when it is seen to be detrimental to status. For example, finding that someone (e.g. a friend) has copied your work will cause more disruption (e.g. anger and conflict) if that will effect your own status in the future rather than if it has no such consequence.

SOCIAL RANK, KINSHIP AND GROUP MEMBERSHIP

Social competition theory may help us understand the powerful psychobiological effects of inferior–superior comparisons; especially when linked with the biological variations associated with rank. However, it is important to recognize that subordinate animals can also be marginalized and pushed to the periphery of the group or even out of it (Trivers, 1985). This may be captured by comparisons that are concerned with feeling different to others and an outsider. Indeed, there is now evidence that both rank (upward–downward, inferior–superior) and similarity of self to others (being like or unlike) are key dimensions of social comparison and both are often used together (Buunk & Hoorens, 1992). In groups, aggressive children are more accepted and have higher status if the group is aggressive but not if it is relatively peaceful. Thus, similarity has a powerful effect on status (Wright, Giammarion & Parad, 1986).

If one is failing but everyone else is too then the effects of failure are lessened. Indeed, in psychotherapy a key helpful experience is the recognition that one is not the only one who is depressed or has been abused, etc. A combination of feeling different and superior is likely to have different effects to that of feeling different and inferior. For example, depressed people not only feel inferior to others but also different (Furnham & Brewin, 1988). The nature of shame also implies both comparisons of inferiority and difference (Buunk & Hoorens, 1992; Gilbert, 1992; Kaufman, 1989).

Although we have focused on rank/status, this alone may be insufficient to understand the motivations and effects of both types of social comparison. For example, we should perhaps not only recognize a need to avoid inferiority and shame but also the importance of the *evolved need for kinship, being like others, a sense of belonging and group membership* (Bailey, 1988; Bailey, Wood & Nava, 1992). Indeed, the motivation to belong and be like others, can have powerful effects on social behavior, values (Argyle, 1991; Wolfe, Lennox & Cutler, 1986) and self-identity/esteem (Abrams *et al.*, 1990). Some of the stress of making unfavorable social comparisons may well arise for the potential loss of a sense of kinship and affiliation, associated with fear of rejection, marginalization, becoming an outsider and loss of support. Yet another dimension may relate to closeness–distance (Birtchnell, 1993).

It also appears to be the case that once groups form there can be group based motives to raise the RHP and SAHP of one's own group in comparison to other groups. Pratto *et al.* (1994) have called this social dominance orientation. The in-group can be treated like kin. Thus one's personal RHP and SAHP may be linked to the fortunes of the group to which one belongs.

CONCLUSIONS

In this paper we have explored how an evolutionary approach can be helpful in understanding the ubiquity of social comparison. We have suggested that many forms of social comparison evolved as components of the mechanisms underlying intrasexual selection, parental investment, reciprocal altruism and the need for membership of specific social groups. Thus, social comparisons can be *pair wise* (one individual to another, as in a boxing match), *triangular* (as in various competitions where the desired outcome is a preferential relationship with a parent or other authority figure, electorate or lover) and *group* (involving comparisons of self to the group in general; being like or unlike "them," and whether one's group/team is superior or inferior to other groups/teams). Thus, the following forms of comparison seem to have evolutionary roots in humans, if not also in other animals:

Stronger/weaker: This comparison of fighting capacity is probably the oldest form of comparison. It relates to resource-holding potential (RHP) and underlies ritual agonistic behavior. This form of social competition subserves intrasexual selection in most vertebrate species. In humans, it involves the ability to make successful challenges and "stand one's ground." In humans ritualized contests of RHP are often expressed in groups (e.g. sports) and unritualized contests in war. Weapons testing may be a form of ritualized RHP display, to signal one's group's potential fighting ability.

More/less attractive to the opposite sex: We know that this comparison is made in our own species, but we do not know how widespread it is in animals, or how much it contributes to intersexual selection.

More/less favored by parents: This comparison of relative parental investment underlies sibling rivalry. It may also occur outside the family in the comparison of investment from authority figures such as teachers, employers and other patrons.

More/less attractive to the reference group: This assessment of relative social attention-holding power (SAHP) is of two types, the comparison of one's own display of attractiveness (talent, abilities, etc.) with the displays of others and the comparison of the response of the group to those displays (relative approbation).

Creditor/debtor: This ledger of favors given and received is an essential part of reciprocal exchange. The comfort one feels in giving and receiving may depend on social comparisons of superiority-inferiority, or weak-strong and fears of (and being seen as) exploiting and being exploited.

In-group/out-group: This type of comparison is one of similarity-difference. Apart from its obvious role in group cohesion and differentiation, it is important for the evaluation of relative attractiveness, because it defines an in-group of evaluators whose social attention is desired, and whose judgements of the performer's display have the power to raise and lower SAHP. This comparison may not only involve judgements of same-different and group membership (being like or unlike, or belonging to), but also the relative superiority-inferiority of the group one feels a member of, in comparison to other groups.

Mental mechanisms have evolved to aid the motivation and competency for such comparisons and subserve the outcomes of these various evaluations. Of particular interest are those which subserve the outcome of "unfavorable social comparison," which can be expressed as depression, anxiety, inferiority, anger, envy, shame and guilt, etc. By linking the concept of social comparison and self-esteem to ranking, social competition, gaining and maintaining status, we are able to plot its phylogenetic course and possible biological effects. It follows, therefore, that social comparison may be one of evolution's most important psychological mechanisms.

REFERENCES

- Abrams, D., Cochrane, S., Hogg, M. A., & Turner, J. C. (1990). Knowing what to think by knowing who you are: Self categorization and the nature of norm formation, conformity and group polarization. *British Journal of Social Psychology*, *29*, 97-119.
- Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., & Syme, S. L. (1994). Socioeconomic status and health. *American Psychologist*, *49*, 15-24.
- Argyle, M. (1991). *Cooperation: The basis of sociability*. London: Routledge.
- Attenborough, D. (1992). *The trials of life*. London: Collins and Sons.
- Bailey, K. G. (1988). Psychological kinships: Implications for the helping professions. *Psychotherapy*, *25*, 132-141.
- Biley, K. G., Wood, H., & Nava, G. R. (1992). What do clients want? Role of psychological kinship in professional helping. *Journal of Psychotherapy Integration*, *2*, 125-147.
- Barkow, J. H. (1980). Prestige and self-esteem: A biosocial interpretation. In D. R. Omark, D. R. Strayer, & J. Freedman (Eds.), *Dominance relations: An ethological view of social conflict and social interaction*. New York: Garland STPM Press.
- Baumeister, R. F. (1982). A self-presentational view of social phenomena. *Psychological Bulletin*, *91*, 3-26.
- Baumeister, R. F., Tice, & Hutton, D. G. (1993). Self-presentation motivations and personality differences in self-esteem. *Journal of Personality*, *57*, 547-579.
- Barash, D. P. (1977). *Sociobiology and behaviour*. London: Heinemann.
- Birtchnell, J. (1993). *How humans relate: A new interpersonal theory*. London: Praeger.
- Broucek, F. J. (1991). *Shame and the self*. New York: Guilford.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, *12*, 1-49.

- Burgess, R. L., & Huston, T. L. (Eds.). (1979). *Social exchange relationships*. New York: Academic Press.
- Buunk, B. P., & Hoorens, V. (1992). Social support and stress: The role of social comparison and social exchange processes. *British Journal of Clinical Psychology*, **31**, 444–457.
- Coopersmith, S. (1967). *The antecedents of self-esteem*. San Francisco: W. H. Freeman.
- Crook, J. H. (1980). *The evolution of human consciousness*. Oxford: Oxford University Press.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: John Murray.
- Dunbar, R. I. M. (1988). *Primate social systems*. London: Croom Helm.
- Dunn, J., & McGuire, S. (1992). Sibling and peer relationships in childhood. *Journal of Child Psychology and Psychiatry*, **33**, 67–106.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, **7**, 117–140.
- Fisher, J. D., Nadler, A., & Whitcher-Alagna, S. (1982). Recipient reactions to aid. *Psychological Bulletin*, **91**, 27–54.
- Furnham, A., & Brewin, C. R. (1988). Social comparison and depression. *Journal of Genetic Psychology*, **149**, 191–198.
- Gerlisma, C., Emmelkamp, P. M. G., & Arrindell, W. A. (1990). Anxiety, depression, and the perception of early parenting: A meta-analysis. *Clinical Psychology Review*, **10**, 251–277.
- Gibbons, F. X., Benbow, C. P., & Gerrad, M. (1994). From top dog to bottom half: Social comparison strategies in response to poor performance. *Journal of Personality and Social Psychology*, **67**, 638–652.
- Gilbert, P. (1989). *Human nature and suffering*. Hove: Lawrence Erlbaum Associates.
- Gilbert, P. (1992). *Depression: The evolution of powerlessness*. Hove: Guilford/Lawrence Erlbaum Associates.
- Gilbert, P., & Allan, S. (1994). Assertiveness, submissive behaviour and social comparison. *British Journal of Clinical Psychology*, **33**, 295–306.
- Gilbert, P., & Trower, P. (1990). The evolution and manifestation of social anxiety. In W. R. Crozier (Ed.), *Shyness and embarrassment: Perspectives from social psychology*. Cambridge: Cambridge University Press.
- Glantz, K., & Pearce, J. K. (1989). *Exiles from Eden: Psychotherapy from an evolutionary perspective*. New York: W. W. Norton and Co.
- Graziano, W. G., Jensen-Campbell, L. A., Shebilske, L. J., & Lundgren, S. R. (1993). Social influence, sex differences, and judgements of beauty: Putting the interpersonal back in interpersonal attraction. *Journal of Personality and Social Psychology*, **65**, 525–531.
- Harber, S., Barchas, P. R., & Barchas, J. D. (1981). A primate analogue of amphetamine induced behaviours in humans. *Biological Psychiatry*, **16**, 181–196.
- Harper, R. C. (1985). Power dominance and non-verbal behaviour: An overview. In J. F. Ellyson & J. F. Dovidio (Eds.), *Power dominance and non-verbal behaviour*. New York: Springer Verlag.
- Hartmann, L. (1992). Presidential address: Reflections on humane values and biopsychosocial integration. *American Journal of Psychiatry*, **149**, 1135–1147.
- Henry, J. P., & Stephens, P. M. (1977). *Stress, health and the social environment: A sociobiologic approach to medicine*. New York: Springer Verlag.
- Kalma, A. (1991). Hierarchicisation and dominance assessment at first glance. *European Journal of Social Psychology*, **21**, 165–181.
- Kaufman, G. (1989). *The psychology of shame*. New York: Springer.
- Kemper, T. D. (1990). *Social structure and testosterone: explorations of the socio-bio-social chain*. New Brunswick: Rutgers University Press.
- Krebs, J. R., & Davies, N. B. (1993). *An introduction to behavioral ecology*, 3rd edn. Oxford: Blackwell Scientific Publications.
- MacLean, P. (1985). Brain evolution relating to family, play and the separation call. *Archives of General Psychiatry*, **42**, 405–417.
- McCrae, E. W., & Buss, J. D. (1984). Childhood family antecedents of dependency and self-criticism. *Journal of Abnormal Psychology*, **93**, 3–8.
- McConville, B. (1985). *Sisters: Love and conflict within the lifelong bond*. New York: Pan Books.

- McGuire, M. T. (1988). On the possibility of ethological explanations of psychiatric disorders. *Acta Psychiatrica Scandinavia* (Suppl. 341, R. H. Van den Hoofdakker (Ed.)), **77**, 7–22.
- Maynard Smith, J. (1982). *Evolution and the theory of games*. Cambridge: Cambridge University Press.
- Nagata, D., & Crosby, F. (1991). Comparisons, justice and the internment of Japanese-Americans. In J. Suls & T. A. Wills (Eds.), *Social comparison: contemporary theory and research*. Hillsdale: Lawrence Erlbaum Associates.
- Parker, G. A. (1974). Assessment strategy and the evolution of fighting behaviour. *Journal of Theoretical Biology*, **47**, 223–243.
- Parker, G. A. (1984). Evolutionary strategies. In J. R. Krebs & N. B. Davies (Eds.), *Behavioral ecology: An evolutionary approach*. Oxford: Blackwell.
- Power, M. (1991). *The egalitarians: Human and chimpanzee: An anthropological view of social organisation*. Cambridge: Cambridge University Press.
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology*, **67**, 741–763.
- Price, J. S. (1988). Alternative channels for negotiating asymmetry in social relationships. In M. R. A. Chance (Ed.), *Social fabrics of the mind*. Hove: Lawrence Erlbaum Associates.
- Price, J. S., & Sloman, L. (1987). Depression as yielding behaviour: An animal model based on Schjelderup-Ebbe's pecking order. *Ethology and Sociobiology*, **8**, 85–98 (suppl.).
- Price, J. S., Sloman, R., Gardner, R., Gilbert, P., & Rhode, P. (1994). The social competition hypothesis of depression. *British Journal of Psychiatry*, **164**, 309–315.
- Raleigh, M. J., McGuire, M. T., Brammer, G. L., & Yuwiler, A. (1984). Social and environmental influences on blood serotonin concentrations in monkeys. *Archives of General Psychiatry*, **41**, 405–410.
- Rippere, V., & Williams, R. (Eds.). (1985). *Wounded Healers*. Chichester: Wiley.
- Salovey, P. (1991). Social comparison processes in envy and jealousy. In J. Suls & T. A. Wills (Eds.), *Social comparison: Contemporary theory and research*. Hillsdale: Lawrence Erlbaum Associates.
- Sapolsky, R. M. (1989). Hypercortisolism among socially subordinate wild baboons originates at the CNS level. *Archives of General Psychiatry*, **46**, 1047–1051.
- Sapolsky, R. M. (1990a). Adrenocortical function, social rank and personality among wild baboons. *Biological Psychiatry*, **28**, 862–878.
- Sapolsky, R. M. (1990b). Stress in the wild. *Scientific American*, January, 106–113.
- Sidanius, J., Pratto, F., & Bobo, L. (1994). Social dominance orientation and the political psychology of gender: A case of invariance? *Journal of Personality and Social Psychology*, **67**, 998–1011.
- Slavin, M. O., & Kriegman, D. (1992). *The adaptive design of the human psyche: Psychoanalysis, evolutionary biology, and the therapeutic process*. New York: Guilford.
- Suls, J., & Wills, T. A. (Eds.). (1991). *Social comparison: Contemporary theory and research*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Swallow, S. R., & Kuiper, N. A. (1988). Social comparison and negative self evaluation: An application to depression. *Clinical Psychology Review*, **8**, 55–76.
- Trivers, R. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, **46**, 35–57.
- Trivers, R. (1974). Parent-offspring conflict. *American Zoologist*, **14**, 249–264.
- Trivers, R. (1985). *Social evolution*. California: Benjamin/Cummings.
- Trower, P., & Gilbert, P. (1989). New theoretical conceptions of social anxiety and social phobia. *Clinical Psychology Review* (Special Issue: Social Phobia), **9**, 19–35.
- Van Schaik, C. P. (1989). The ecology of social relationships amongst female primates. In V. Standen & R. A. Foley (Eds.), *Comparative socioecology: The behavioral ecology of humans and other animals*. Oxford: Blackwell.
- Wenegrat, B. (1984). *Sociobiology and mental disorder: A new view*. California: Addison-Wesley.
- Wheeler, L. (1991). A brief history of social comparison. In J. Suls & T. A. Wills (Eds.), *Social comparison: Contemporary theory and research*. Hillsdale, NJ: Lawrence Erlbaum Associates.

- Wilkinson, R. G. (1992). Income distribution and life expectancy. *British Medical Journal*, *304*, 165-168.
- Wolfe, R. N., Lennox, R. D., & Cutler, B. L. (1986). Getting along and getting ahead: Empirical support for a theory of protective and acquisitive self-presentation. *Journal of Social and Personality Psychology*, *50*, 356-361.
- Wood, J. V. (1989). Theory and research concerning social comparisons of personal attributes. *Psychological Bulletin*, *106*, 231-248.
- Wood, J. V., Giordano-Beech, M., Taylor, K. L., Michela J. L., & Gaus, V. (1994). Strategies of social comparison among people with low-self-esteem: Self-protection and self-enhancement. *Journal of Personality and Social Psychology*, *67*, 713-731.
- Wright, J. C., Giammarion, M., & Parad, H. W. (1986). Social status in small groups: Individual-group similarity and "misfit." *Journal of Personality and Social Psychology*, *50*, 523-536.