Howling demands: the role of emotions in approval and censorship behaviors in wolf packs*

Uivando exigências: o papel das emoções nos comportamentos de aprovação e censura em alcateias

Aullando requisitos: el papel de las emociones en los comportamientos de aprobación y censura en manadas de lobos

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Abstract: The primary goal of this article is to explain the crucial role of emotions in the moral behavior of social mammals. Morality can be understood as a natural system of reciprocal demands in which wolves are engaged from birth, and where the emotional bonds between members of the pack play a key role. Empirical evidence suggests that the relationship between emotions and social instincts allows wolves to exhibit morally qualified social behaviors, as evidenced by the complex social systems within wolf packs. The article draws connections between cognitive research on emotions and psychobiological systems to contemporary studies in wolf ethology. It provides empirical support to the philosophical hypothesis that emotions arise in response to a range of socially significant events. Thus, we aim to review the nature of the inherent emotional demands of morality and their relationship with the natural traits that allowed wolves to develop a complex social life. Therefore, the article presents the required elements for the emergence of inherent morality in mammals with a complex social life, which seems to be a strong argument in favor of a theory that provides an evolutionary basis for morality.

Keywords: Moral. Emotions. Wolves. Emotivism. Ethology.

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Resumo: O ponto central deste artigo é explicar como as emoções desempenham um papel fundamental no comportamento moral dos mamíferos sociais. Entendida como um fenômeno natural, a moralidade é caracterizada como um sistema de exigências recíprocas, em que os lobos estão envolvidos desde o nascimento, e o vínculo emocional entre os membros da matilha desempenha um papel fundamental. O argumento é empiricamente informado para apresentar uma possível relação entre emoções e instintos sociais com relação à aptidão dos lobos para comportamentos sociais moralmente qualificados, com base na existência de um sistema social complexo dentro da alcateia. O artigo relaciona pesquisas cognitivas sobre emoções e sistemas psicobiológicos a estudos contemporâneos em etologia de lobos para apoiar, empiricamente, a tese filosófica de que emoções surgem em resposta a uma série de eventos socialmente significativos. Assim, o objetivo é elucidar a natureza das demandas emocionais inerentes à moralidade, bem como sua relação com as características naturais que permitiram aos lobos desenvolver uma vida social complexa. Nesse sentido, o artigo pretende apresentar os elementos necessários para o surgimento de um fenômeno moral inerente aos mamíferos com vida social complexa, o que parece ser um forte argumento a favor de uma teoria que explique a moralidade em bases evolutivas.

Palavras-chave: Moral. Emoções. Lobos. Emotivismo. Etologia.

Resumen: El punto central de este artículo es explicar cómo las emociones juegan un papel clave en el comportamiento moral de los mamíferos sociales. Entendido como un fenómeno natural, la moralidad se caracteriza como un sistema de demandas recíprocas donde los lobos se comprometen desde el nacimiento, donde el vínculo emocional entre los miembros de la manada juega un papel clave. El argumento se informa empíricamente para presentar una posible relación entre las emociones y los instintos sociales hacia la aptitud de los lobos a comportamientos sociales moralmente calificados basados en la existencia de un sistema social complejo dentro de la manada. El artículo relaciona las investigaciones cognitivas sobre las emociones y los sistemas psicobiológicos con estudios contemporáneos en la etología del lobo para apoyar empíricamente la tesis filosófica de que las emociones surgen en respuesta a una gama de eventos socialmente significativos. Por lo tanto, el punto es dilucidar la naturaleza de las demandas emocionales inherentes a la moral, así como su relación con las características naturales que permitieron a los lobos desarrollar una vida social compleja. En este sentido, el artículo tiene como objetivo presentar los elementos necesarios para la aparición de

un fenómeno moral inherente a los mamíferos con vida social compleja, lo que parece ser un fuerte argumento a favor de una teoría que explica la moralidad en las bases evolutivas.

Palabras clave: Moral. Emociones. Lobos. Emotivismo. Etología.

Introduction

Rules of coexistence guide the lives of social mammals. From the way the food is divided up to each member's role in the group, there are expectations about how everyone should behave. Evolutionary biology is accurate in pointing out why those behaviors are adaptive, while ethology identifies the ones considered to be socially relevant in different species. Those explanations falls under the perspective of what Darwall (2006) calls an *ideal observer*. However, it is not plausible that all those animals intentionally act concerning its preservation as a whole – its focus is on the survival of their group, not the species. In a personal observation of great sensitivity, Vucetich (2013) defined wolves as *experiencers of life* and, therefore, caught in the same web of pleasure and pain that gives meaning to our existence. In this sense, this article aims to present how basic emotions are a plausible hypothesis to explain the social and moral motivations of wolves, without falling into an anthropomorphic explanation of their group relations.

Naturalistic metaethics and evolutionary anthropology have traditionally understood morality as a set of reoccurring social behaviors driven by reciprocal demands observed in small groups. De Waal (2003) defined the *norm as* a product of social instincts, which is neither unique to humans, nor a conscious decision guided by cultural values, but a byproduct of gradual social evolution. Tugendhat (2001) observes that moral approval or censorship behaviors are intrinsic to the internal dynamics of social groups, where *normativity* represents a system of reciprocal demands in which group members are engaged from birth. This article diverges from Tugendhat's original proposal in three main respects: i) in the present study, we regard normativity as based on emotions rather than sentiments; ii) we replaced indignation with anger as a basic moral emotion; and iii) we indicate that conceptual knowledge is not necessary to perceive others as morally good.[4]

[4] A complete investigation of Tugendhat's position on morality can be found in Silveira (2018).

Emotionist and emotivist positions in metaethics generally sustain that moral emotions are triggered when the members of a social group apprehend antisocial behaviors. According to Prinz (2007, p. 29), "having a moral attitude is a matter of having an emotional disposition". The author observes that moral judgements are not only related to the ability to experience emotions but are necessary for a behavior to be moralized. For example, if an individual does something wrong and does not feel guilt, the lack of remorse might increase the anger directed at him. The scale of merit granted to socially relevant attitudes is based on the emotional reactions associated to basic emotions. In this sense, emotions are tied to the concept of wrong much like the mental image of color is tied to the thought of a specific object.

> A standing judgment that something is wrong consists in the standing disposition [...], and an occurrent judgment will ordinarily contain emotional disposition. The emotion serves as the vehicle of the concept 'wrong' in much the same way that an image of some specific hue might serve as the vehicle for the thought that cherries are red (PRINZ, 2006, p. 34).

Rozin *et al*. (1999) observed that the distinction between socially inadequate and deviant behavior lays in the intensity of the emotional response to the damage given behavior causes to the group's wellbeing. Greene (2013) demonstrates that in order to morally approve or censor a behavior X, one must have the physiological capacity to feel guilty toward X, or to direct their anger at others. He establishes that the difference between following social and moral rules lies in the biological ability to diverge from the norm. In order for the intrinsic normativity of moral assessment to arise, individuals must be able to survive outside the community.[5] Within the community, however, an individual's behavior must be constrained by reciprocal demands grounded on emotions, since those who violate group norms are perceived as untruthful and lose value to their peers.

[5] According to Thurber and Peterson (1993) and Reyes (1995), wolves get 30%-40% more food when hunting alone or in pairs relative to when hunting in a pack. Dale *et al.* (1995) put this figure at 40-65%. There is not enough empirical evidence to suggest that wolves' social behavior leads to increased efficiency in hunting and self-feeding. As such, the adaptive advantage of social behavior in wolves does not relate to the ability to obtain food. Instead, it is more likely tied to defending the territory, protecting against predators, securing food for their offspring, teaching the latter to hunt, and gaining experience by young individuals.

> In fact, morality is a collection of devices, a suite of psychological capacities and dispositions that together promote and stabilize cooperative behavior [...]. We need not reason through the logic of cooperation in order to cooperate. Instead, we have feelings that do this thinking for us (GREENE, 2013, p. 61-133).

To explain normative behaviors from an evolutionary perspective, we must establish a natural foundation to distinguish social and moral rules. That raises questions about how to perceive morality as a natural phenomenon. The answer to these questions is not as simple as the assumption that social animals are instinctively inclined to follow social rules. Bees (*Apis mellifera*), for example, often die to defend their colonies, thereby demonstrating biological altruism. However, one cannot infer that these actions are motivated by an underlying moral nature. Therefore, there is a need to understand the extent to which animals with a complex social life could be naturally inclined to follow moral rules by examining these behaviors from an emotional perspective. In the process, it will be necessary to understand the distinction between following social and moral rules to differentiate between socially determined behaviors and legitimate interest in the group's wellbeing. The first step in this process is to understand how social behaviors transmit across generations and to explore the role of emotions in this mechanism.

1 Considerations on social evolution

The evolution of social behavior through natural selection has often been discussed in evolutionary biology. Sociability manifests in various forms, ranging from the rigid behavior of bees to the complex hierarchy of wolves. It can be primarily defined as a set of behaviors that increases the survival fitness of the species in which occurs. According to Hamilton (1964), social behavior is selected for when the emergence of a social trait increases the survival or reproductive advantage to the organisms who carry it. Wade *et al*. (2010) state that related individuals cooperate because aiding the survival of their kin propagates their partially shared genes, creating a selection mechanism for altruistic behaviors. Based on these observations, the authors propose an *inclusive fitness theory*, according to which the propagation of social behaviors is tied to the statistical probability that an individual benefits from the considered social trait.

Kin selection theory addresses the benefits to close relatives who may also carry and propagate a specific trait. Axelrod and Hamilton (1981) argue that kin recognition is possible because as social animals live in close groups, it is likely that almost all of the group members that interact with each other are related. Under these conditions, prosocial behavior will increase the likelihood that an individual's genetic information transmits to future generations, either through their offspring, or the offspring of other members of the group. Mitteldorf and Wilson (2000) showed that fluctuations in population density could temporarily increase the benefits of local cooperation, promoting the evolution of prosocial behavior.

> Just as the ability to recognize the other player is invaluable in extending the range of stable cooperation, the ability to monitor cues for the likelihood of continued interaction is helpful as an indication of when reciprocal cooperation is or is not stable (AXELROD; HAMILTON, 1981, p. 1.392-1.393).

When investigating sociability, it is essential to consider the selective pressures that eliminate small groups within a species, as when inner competition exceeds social collaboration. Under natural selection, groups that cooperate more effectively may be more likely to survive and reproduce than those that do not. Wilson and Sober (1994) state that all levels of life – from genes to cells, organisms, and groups – work in tandem to maximize fitness and reproductive success. O'Gorman *et al*. (2008) asserts that, for a group-beneficial trait to spread, group-level selective pressures (competition between groups) must outweigh individual selection pressures (competition within groups). Since the actions of natural selection occur at the phenotypic level, this will be the focus of the present investigation. It is hypothesized that social norms reduce individual variation and competition, and that prosocial behavior shifts and propagates though phenotypic transmission.[6]

> knowing the fitness consequences of traits at the phenotypic level tells us what would evolve by natural selection if the environment were held constant and the traits had a simple genetic basis [...]. There is no gene for pulling our hand away

[6] The equation can be presented as $rbk + be > c$, where **r** is the degree of kinship, bk is the benefit to kin and **be** is the benefit to the group as a whole, while **c** is the cost of the prosocial behavior.

> from the fire, but we still express the behavior under appropriate circumstances and it is biologically adaptive to do so (WILSON; SOBER, 1994, p. 647).

De Jong (2005) states that phenotypic plasticity can evolve if changes in the phenotype increase evolutionary fitness. Such circumstances would favor the selection of the ability to express different traits. According to Hartl and Clark (1997), wolves and dogs (*Canis lupus familiaris*) show few structural gene mutations, since these populations have an approximate mutation rate of 105 per gene per generation. Ostrander (2005) demonstrated that the canine genotype originated from populations of gray wolves and was later enriched by backcrosses with wolves. The authors stress that the gene pool of the original wild wolf populations provides sufficient raw material for the phenotypic plasticity, genetic transmission mechanisms, and behavioral developments observed in both wolves and dogs.

The immense phenotypic plasticity of dogs has its origins in the standing genetic variation in the ancestral population of wolves. Selection experiments have shown that plasticity can evolve under direct selection or as a correlate of particular traits. Garland and Kelly (2006) view phenotypic plasticity as an evolutionary adaptation to the environmental variation, which allows individuals to adapt their phenotype to different environments. In the context of sociability, phenotypic plasticity may explain changes in coping behaviors in response to environmental variations, as well as all types of environmentally induced modifications, from acclimatization to learning.

Mech (1999) suggests that kinship ties may explain the social dynamics of wolf packs, which are not organized in a rigid hierarchy. The author observed that calling a wolf an *alpha* contributes to a misperception of wolf packs as having a hierarchical structure determined by physical superiority. On the contrary, the leaders of a wolf pack are defined based on their role as procreators. Social behavior is essential for the survival of wolves. The embodied expression of their intentions (such as displays of dominance and submission) is therefore particularly important to reduce social distance and promote friendly relations.

> Thus, calling a wolf an alpha is usually no more appropriate than referring to a human parent or a doe deer as an alpha. Any parent is dominant to its young offspring, so "alpha" adds no information. Why not refer to an alpha female as the female

> parent, the breeding female, the matriarch, or simply the mother? Such a designation emphasizes not the animal's dominant status, which is trivial information, but its role as pack progenitor, which is critical information (MECH, 1999, p. 1.198).

Behavioral dynamics in wild wolves reveal a flexible social structure with a hierarchy based on family bonds, where the breeding pair is not above the social rules of the pack. Though initially used simply as a rhetorical device, the metaphor of wolf packs as families is highly plausible. Family relationships are grounded on emotional bonds and sustained by social behaviors of dominance and submission, which are intrinsic to their dynamics and strongly associated with the embodied expression of emotion. However, emotions in wolves (or any other non-primate animal) have been historically characterized as human projections. To challenge this perspective, there is a need to delve deeper into the very nature of emotions and their manifestations.

According to the naturalistic position advocated by Prinz (2004), embodied emotional reactions are elicited by homologous brain systems in social mammals. Although the author is not an evolutionist *per se*, this statement is compatible with an evolutionary perspective. Darwin (1872) argued that the evolutionary driving force of social behavior could not be negative; otherwise, it would have led to self-destruction, and no species with these characteristics would have survived. Given that basic emotions emerge in the same way across different species, it makes no sense to classify them according to supposed degrees of cognitive complexity. In evolutionary terms, social behaviors' emotional nature is a phenotypic variation that social mammals retained due to its highly adaptive value.

> Infants smile when stimulated, rats freeze when threatened, and cats bristle their hairs when a predator approaches. These expressions probably operate under the control of brain structures that are homologous to structures found in adult humans. If emotional circuits and expressions like ours are found in organisms that operate outside our cultures, then it is odd to attribute emotions to culture. Clearly emotions have a biological basis (PRINZ, 2004, p. 114).

Greene (2013) perspective reinforce this position by stressing that an action that socially benefits the group tends to arouse an emotional state perceived as *good* by its members. Similarly, negative emotions may have evolved as embodied expressions of censorship

towards behaviors unwelcomed to social settings. The aim of this article is to carry out a conceptual exploration of the ability to legitimately experience emotion as an adaptive social process in social mammals, for whom mutual reinforcement systems increase the potential for emotional attachment. Emotions may act as a social control mechanism, where the censorship of antisocial behaviors makes an essential contribution to the functional aspect of social relations and facilitates the coordination of group behavior.

2 Embodied emotions

Emotions are inseparable from their underlying brain mechanisms; whose understanding is crucial for the comprehension of the nature of emotional processes. According to Adolphs (2002), the occipital lobes visual cortex is strongly associated with these processes. Baker *et al*. (2018) state that behaviors such as approaching or avoiding danger involve the activation of the ventral stream of visual processing to allow form recognition, while the dorsal stream activates in order to represent objects and the movement of eyes or arms. Facial and body expressions of basic emotions pass through the fusiform visual cortex to the amygdala, where they are processed and transmitted back to the cerebral cortex to collect static information about the emotion in question.

In complex vertebrates, the amygdala is located deep and medially within the temporal lobes. Marin (1999) states that its primary roles include memory processing, decision-making and emotional responses. Following this perspective, Huijgen *et al*. (2015) consider the amygdala essential to the storage of memories linked to emotional events, with enhanced signaling in the affected neurons playing a role in the association between stimuli and the aversion to the events they predict. Therefore, the amygdala is vital to emotional learning, with stimuli intensity enabling greater social integration and cooperation among related individuals.

> An abundance of evidence indicates that neurons in the amygdala are essential for simple forms of emotional learning and memory, such as Pavlovian fear conditioning in rats. In the amygdala, LTP is an enduring form of synaptic plasticity that has been posited to have a role in Pavlovian fear conditioning (MAREN, 1999, p. 566).

The prefrontal cortex covers the front part of the frontal lobe and is involved in behavior planning, personality expression, decision-making and the regulation of social behavior. Price and Morris (1999) established that the dorsal prefrontal cortex widely connects with brain regions involved in attention, cognition, and action, while the ventral prefrontal cortex connects more to brain regions involved in emotion processing. Wang and Hamilton (2015) confirm this position, observing that prefrontal cortex also receives input from the brainstem arousal systems, with neurotransmitters such as serotonin and dopamine playing a vital role in these connections.

Serotonin is a neurotransmitter with a complex and multifaceted role, which involves the modulation of numerous physiological processes. Hensler (2009) states that serotonergic projections from the caudal nuclei regulate emotions such as anxiety and fear, contributing to behavioral responses to sudden environmental changes as well as long-term adaptations. Dopamine is associated with motor control and plays an important role in behavior changes and response selection. Schultz (2015) observed that the dopaminergic response to rewarding stimuli contributes to encoding information about the value and context of a reward, signaling prediction errors, and expected values. Evidence from microelectrode recordings in animal brains shows that dopaminergic neurons are crucial for reward-related cognition and for assigning values to different goals based on information obtained from long-term memory.

> Rewards are necessary for survival. Without rewards we would die of thirst within days and of hunger within weeks [...]. Genetic dispositions, education[7], and long-term reward experience are instrumental for establishing personal reward preferences that influence the whole life of individuals (SCHULTZ, 2015, p. 936).

The anterior cingulate cortex is involved in the emotional modulation of attention, decision-making, behavior monitoring, and error detection. Dedovic *et al*. (2016) identified correlations between dorsal anterior cingulate cortex activity and the detection and appraisal

[7] Education should not be confused with formal teaching; in this context, education refers to the instinctive ability to learn by observation about survival-related behaviors, from hunting and territory defense to how to properly respond to group demands.

of collective behavior, including social exclusion, and an increased focus on social evaluation. The anterior cingulate cortex mediates the emotional response to potentially dangerous targets and plays an active role in error detection and monitoring to trigger appropriate motor responses.

Emotions constitute an effective response to problems faced by mammals throughout their evolutionary history. In the context of collective behavior, Keltner *et al*. (2006) argue that emotional traits were selected in response to negative selective pressure that arose from the social environment in which those animals evolved. Tooby and Cosmides (2008) suggest that each emotion is a set of programs that guide behavioral processes in the face of specific types of problems. The functional mechanisms that comprise the psychobiological systems of sociability were formed by natural selection to solve specific problems and regulate behavior in a way that increased genetic fitness.

> First, natural selection has shaped emotion programs to signal their activation, or not, on an emotion-by-emotion basis. For each emotion program considered by itself (jealousy, loneliness, disgust, predatoriness, parental love, sexual attraction, gratitude, fear), there was a net benefit or cost to having others know that mental state, averaged across individuals over evolutionary time. For those recurrent situations in which, on average, it was beneficial to share one's emotion state (and hence assessment of the situation) with those one was with, species-typical facial and other expressions of emotion were constructed by selection (TOOBY; COSMIDES, 2008, p. 127).

Fredrickson and Cohn (2008) define joy as a facilitator of playful and creative behaviors, both social and physical. Happiness is also experienced within safe, close relationships, creating a continuous motivation for individuals to interact with, and get to know one another. These emotions strengthen the bonds between companions, parents, and offspring by reducing stress levels in the group. According to Tong (2007), the appraisal dimension of positive emotions is essential to the interpersonal reciprocity observed in behaviors such as playing, exploring, enjoying and integrating experiences. Grief, on the other hand, leads to abandonment and isolation, thus facilitating predation, as noted by Bonanno *et al* (2008). Therefore, in the evolutionary sense, experiencing sadness interspersed with positive emotions is more useful than a passive response, which

may have evolved as an adaptation to get the necessary support and resources within a cohesive social group.

Anger is a basic emotion that serves a variety of adaptive functions. Saarni *et al*. (2006) argue that aggressive emotions are involved in the regulation of physiological and psychological processes related to self-defense. Lemerise and Dodge (2008) add to this argument, suggesting that anger also plays an important role in the regulation of social and interpersonal behaviors by motivating individuals to repair transgressions. While anger is directed at others, guilt is the emotional state produced when individuals feel that their actions are wrong. According to Lewis (2008), this usually occurs when an action or personal characteristic results in a social norm violation. While shame is primarily directed toward the self, guilt denotes the intention and disposition to repair the error.

Tracy and Matsumoto (2008) describe shame as a display of submission, whose physical expression tends to appease onlookers who observed the social transgression. By communicating the awareness of their transgression, the individual can maintain their reputation as a trusted member of the group who accepts the prevailing social norms. One can draw a contrast between this behavior and the expression of pride, which involves the outward expansion of the body, through which individuals broadcast their accomplishments, while also cementing their status and continued acceptance within their social group.

Schnall *et al*. (2008) conducted experiments that support the role of unpleasant emotions in the censorship of socially relevant behaviors. In one of these experiments, individuals were asked to look over a series of vignettes and make moral judgments about the actions described. Half of the participants were seated at a clean table in a pleasant environment. The other half sat at a dirty table, surrounded by used handkerchiefs, dirty glasses, and greasy pizza boxes. The latter group was also given a chewed pencil to record their responses about the vignettes. The study revealed that the individuals sitting at the dirty table made more severe moral judgments than those in a clean environment. These findings support the role of disgust as a drive to avoid individuals that violate relevant social rules.

Figure 1 – Relationship between social scenarios and emotions

Problem	**Functional system**	**Emotion**	**Specific function**
Finding a mate	Sex	Desire	Increases likelihood of sexual contact.
Keeping a mate	Mate protection Attachment	Happiness Joy Sadness	Strengthens bonds between parents and offspring. Reduces the stress of companions and offspring. Signals internal stress and elicits friendliness from companions and offspring.
Cooperation	Biological altruism	Guilt Anger	Repairs own transgressions of reciprocity. Motivates others to repair transgressions
Group organization	Dominance Hierarchy	Pride Shame Disgust	Displays high status. Displays submission and pacify possible aggressors. Excludes group members who violate social rules.

Emotions play an important role in moderating instincts, as the impulse to seek pleasure and avoid pain is essential for survival. For social animals such as wolves, pleasure and pain acquire a broader scope, since the happiness of the individual in a group often depends on the wellbeing of his companions. In such a context, the brain states associated with physical feedback, embodied emotion perception, and the association of basic emotions to specific scenarios is especially important. This process is responsible for modulating responses of fear and anxiety, as well as emotions such as guilt, shame, anger, disgust, sadness, happiness, and joy, all of which elicit embodied responses to different life events.

Fear and anxiety are adaptations that effectively draw the individual's attention to issues that threaten survival. They drive the mechanism behind the urge to *get food* and the expectation to *not fall from a cliff* when walking on the edge of a mountain, both observed in animals. For wolves and other social mammals, behaviors related to the

violation of group norms is also a threat to survival.[8] Negative emotions such as anger, disgust, shame, guilt and sadness are embodied signals of immediate social danger, calling attention to specific social scenarios. In these cases, the social expectations trigger instinctual demands, such as *be truthful to the group*. The basic survival instinct and accompanying emotions, as well as the activity of brain regions associated with these responses are the same in both cases. The difference is that in the second scenario, the danger is perceived in antisocial behaviors.

According to Plutchik (1984), emotions are like lungs in air-breathing animals, in that both are biological characteristics of such vital importance that evolution conserved them from the moment they arose. The term *emotion* is simply a way to describe a type of behavioral adaptation. Silveira (2019), for instance, notes that psychobiological social systems can regulate behavior through embodied emotional expressions of approval and censorship; these processes help sustain social bonds such as those observed in wolf packs and facilitate the coordination of group actions.

The current literature on emotion does not indicate clearly which behaviors are triggering specific emotions in wolves or primates. While there is sufficient empirical evidence to support the importance of emotions in these animals' social lives, the ability to experience emotions does not necessarily imply that these animals will follow social norms or react morally when social norms are violated. Much research is still needed to collect the empirical evidence required to address these issues. Nevertheless, it is possible to analyze emotions on empirical-basis, and that is the aim of the last section of this article.

3 Psychobiological bases of morality

Social rules guide a significant part of the lives of primates and wolves. The kind of bond shared by individuals determines all interactions within the group during waking hours, and even how individuals sleep. However, it does not follow that all of these behaviors

[8] A common mistake in this type of study is to generalize behavioral competencies and values from one species (notably, humans) to another. A wolf is a wolf, while a human is a human, and each species or group will have a different social organization and set of social rules. Since each group has a different set of norms, the behaviors that trigger negative emotions will also differ. What we argue is that the response to rule violation can be similar in both cases, and take the form of an emotional reaction.

belong to the normative sphere of morality. There is, as such, a need to find a criterion to differentiate between moral behavior and other forms of social interaction. We propose a possible evolutionary approach to this problem. Based on empirical evidence, we hypothesize that moral approval and censorship behaviors are emotional responses induced by basic emotions. These behaviors are crucial to maintaining the social dynamics of a group and ensure the survival of its members.

According to the emotivist approach, moral behaviors are reactions guided by one of two different types of emotions that occur in socially relevant scenarios. Positive emotional reactions are associated with social approval, and range from friendliness, happiness, and joy, to self-pride and biological altruism.[9] Negative emotions like anger, anxiety, fear or even guilt, disgust and shame are connected to social censorship of the self or others. The idea of an empirically-based, naturalistic grounding of moral phenomena is not new in philosophy. This perspective is presented in Hume (2007), for whom the ultimate foundation of morality is in the natural constitution of social individuals.

> If nature hadn't made any such distinction based on the original constitution of the mind, language would not have contained the words "honorable" and "shameful", "lovely" and "odious", "noble" and "despicable"; and if politicians had invented these terms, they could never have made them intelligible to anyone (HUME, 2007, p. 25).

Cleckley (1941) establishes that emotions influence character judgments in the same way that emotional deficiencies may result in *moral blindness*. Similarly, Patrick (1994) notes that extremely violent and pathologically wicked individuals suffer from a profound absence of negative emotions, from fear and guilt to disgust and shame. Blair (1995) reinforces this argument by demonstrating that psychopaths cannot distinguish between moral and conventional social rules, which they perceive to be the same. The inability to experience even basic emotions prevents these individuals from establishing social bonds and reciprocal relations, two pivotal elements of moral behavior. As such, even if gifted with above-average intellectual and reasoning skills, they show a profound inability to act based on moral rules.

[9] Biological altruism can be understood as an action in benefit of another, in which an altruistic animal expends more energy than it gains.

> Yet the psychopath shows not only a deficiency but apparently a total absence of self-appraisal as a real and moving experience. Here is the spectacle of a person who uses all the words that would be used by someone who understands, and who could define all the words but who still is blind to the meaning (CLECKLEY, 1941, p. 351).

These observations do not implicate that a social rule should be considered moral just because it causes one of the previously mentioned emotional responses. For instance, it is common to experience pain or disgust when one accidentally cuts their finger, but this does not necessarily elicit shame or guilt toward the action. Given the normative social aspect of moral relations, we argue that emotions only acquire a moral nature when they are felt as a response to socially relevant interactions. In order for these principles to play a normative role, they must occur in the presence of an intersubjective common ground, such as the social psychobiological systems observed in animals with a complex social life.

Evolutionary theories suggest that social behaviors related to phenotypic plasticity preserved due to their highly adaptive value in psychobiological systems of social interaction. According to Tooby and Cosmides (1996), emotional bonds are the product of specialized brain systems responsible for the elicitation of emotional reactions to social behavior, which emerged in response to recurring situations throughout evolution. Decety and Jackson (2006) observed that psychobiological systems act as a bridge of emotional resonance that activates motor representations by associating autonomic and somatic responses in an inverse brain mapping. The cohesive functionality of these areas gives social mammals the ability to conform to behavioral constraints of social interactions in small groups.

> At one level, emotional expression are governed by rules and can be elicited by simple stimuli, as in the example of disgust in the presence of bitter taste. However, humans and other animals also use bodily expressions to communicate various type of information to members of their own species [...]. Such a system prompts the observer to resonate with the state of another individual, with the observer activating the motor representations and associated autonomic and somatic responses that stem from the observed target – that is, a sort of inverse mapping (DECETY; JACKSON, 2006, p. 77-78).

An elementary characteristic of social cohesion is the capacity to instinctively understand the intentions of another individual and react accordingly in an evolutionarily advantageous way. Darwin (1981) states that social instincts have high adaptive value, since harmonious group interactions are essential for social animals to protect their offspring and territory. Social instincts have evolved in distinct ways across species, ranging from the hardwired social structures of insects to the flexible behaviors of mammals, which have high behavioral plasticity and may survive without the support of a group. In wolves and primates, these traits can be defined as a tendency to mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another individual. Boyd and Richerson (2006) argue that the adaptive value of social instincts is attributable to their favorable effects on group cooperation, which consists of group-oriented behaviors that are carried out despite their energetic cost.

> The social instincts lead an animal to take pleasure in the society of its fellows [...] and to perform various services for them. The services may be of a definite and evidently instinctive nature; or there may be only a wish and readiness, as with most of the higher social animals, to aid their fellows in certain general ways (DARWIN, 1981, p. 55).

Emotional bonding is an adaptation related to social instincts and is central to the way social mammals behave within groups. Decety and Jackson (2006) define psychobiological systems as having a genetic basis that allows for emotional resonance within a group. Biological ability to not follow antisocial norms, characterized as unnecessary dangerous or borderline perverse, plays an important role in distinguishing between moral behavior and other forms of social interactions. For instance, an individual that is biologically incapable of being disloyal could never be the subject of social expectations regarding their loyalty, since they lack the biological ability to act in any other way.[10] The basic primary emotions arise precisely when social expectations are not fulfilled. In other words, when an individual behaves differently from what is expected of them, instinctive emotional responses emerge as a form of

[10] That is the case of insects, but not of social mammals. As mentioned earlier in this article, wolves have the biological ability to break the rules of the pack and live solitary lives; the fact that they do not usually do this does not mean that they could not do it.

a non-conceptual judgement that can vary from mild disappointment to total exclusion from the group.

Social behaviors are the expressions of phenotypes related to psychobiological systems and manifested as embodied emotional responses. They were acquired and selected for as they aided the survival of group-living mammals, like wolves or primates. However, a behavior X, which leads to emotional discomfort of guilt and shame, or suffering from the anger of their companions, will be different in wolves than in primates. If one never does X and adheres to the group rules, this will be perceived as good by their peers. Since wolves have biological freedom, a good wolf is not only reliable, but also loyal.

In conclusion, an individual who displays loyalty is perceived as trustworthy and, consequently, a good member of the group. In a social dynamic guided by synchronous emotional demands, the range of social behaviors is restricted and influenced by the reciprocal demands of group members. Even if their biological freedom allows them to act differently, emotional pressures inhibit such behaviors and restrict freedom so that their actions are compliant with what is expected of them. The moral qualifier good relates to truthful behaviors, which follow the rules of the group and do not significantly disrupt its inner harmony, thus risking survival of its' members. Although the actions perceived as good or bad vary between species, and since self-destructive behaviors tend to be a negatively selected trait, it is likely that social animals have a natural moral compass, guided by prosocial tendencies beneficial to members of the group.

Conclusion

More research is needed to examine the emotional responses of wolves. However, given their biological freedom, social flexibility, and complex group dynamics, they may have adapted to behave according to emotions that influence the approval and censorship of other pack members. Wolves share some natural qualities with primates, including social family bonds and the expression of emotional demands towards their peers in the form of socially relevant behaviors.

Currently, there is insufficient empirical evidence to establish truthful behaviors as a result of phenotypic transmissions. Nevertheless, they can be understood as a behavioral tendency tied to the allocation

of social value to an individual, which provides a distinction between social and moral behaviors. Since being truthful entails a restriction of biological freedom and an instinctive disposition to act in a specific way, moral behaviors require only the capacity to experience emotions triggered by psychobiological systems. In this sense, it is plausible to consider that the adaptive value of morality may justify its phenotypic persistence, and its definition as an intrinsic behavior of mammals with a complex social life, such as humans and wolves.

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