On Humor and “Laughing” Rats

The Importance of Plessner for Affective Neuroscience

Heleen J. Pott

Introduction

The philosophical study of laughing has a long history, including contributions from Plato, Aristotle, Descartes, Kant, Schopenhauer, and Bergson. In trying to understand the meaning of human laughter, philosophers traditionally investigated the occasions that make us laugh: jokes, comedy, and humour, asking questions of when and why it is that we burst out into laughter. Everyone considered laughter to be a uniquely human capacity. “No other living things laugh,” as Aristotle puts it in *Parts of Animals* (673a9).

In recent times, scientists began to question philosophy's assumption of laughter as a phenomenon exclusively found in human beings. Laughter is not unique to humans, as other primates do it as well. Contrary to popular opinion, most laughter is not about humour, but about social relationships, says psychologist Robert Provine in his bestselling book *Laughter: A Scientific Investigation* (2000). Laughter’s emergence within the evolution of the mammalian brain took place much earlier than is generally believed, predating the development of language by perhaps millions of years.

According to neuroscientist Jaak Panksepp, even non-primate mammalian brains are capable of producing laughter. In *Affective Neuroscience* (1998) he famously defends the claim that rats laugh when you tickle them, although we just can’t hear the ultrasonic play vocalizations because of the high frequency (50 kHz). Panksepp’s proposal is that circuits for laughter and play exist in very ancient regions of the brain that we share not only with chimpanzees and apes, but also with rats and other rodents.

Does this mean that philosophy has lost its relevance to the study of laughter today? Should we disqualify philosophical studies because of their anthropocentrism and turn to empirical research on the laughter of chimps, dogs and rats instead? Or is there still reason to see the “laughing” of rats and other mammals as behavior that is qualitatively different from most types of human laughter – is animal laughter not genuine laughter after all, as philosophers traditionally made us believe?

In this paper I will defend the thesis that we don’t necessarily have to choose between these two options. Instead, I will argue that traditional
philosophical approaches are perfectly compatible with the results of today's scientific research on animal laughter. To clarify this point, I will revisit Helmuth Plessner's hermeneutics of laughter presented in *Laughing and Crying* (1970) and show that a rethinking of Plessner's conceptual framework has much to teach us today about how there is a shared evolutionary basis for human and animal laughter, while at the same time highlighting important ways in which laughing can be seen as an exclusively human trait.

**Why do we laugh?**

Why do we laugh? What conditions and mechanisms are involved that trigger the explosion of gasping, grunting noises ensuing from such diverse stimuli as hearing funny jokes, watching Mr. Bean on TV, attending a birthday party, or smoking weed with friends?

The question may seem simple, but it is incredibly difficult to formulate an adequate answer. At first sight, nothing could be more common than laughing. We all do it, it is part of a vocabulary that is shared by the members of all different cultures. You don't have to learn it, the language of laughter is understood ubiquitously. Even children who are born blind and deaf still retain the capacity to laugh.

However, as soon as you actually try to answer *why* we make these weird noises, laughing stops seeming familiar. One of the puzzling things about it is that we do not freely, consciously and purposefully choose to break out into laughter, it simply happens to us in certain situations. There has been no preliminary decision to laugh, and we cannot start it on command. Only very good actors can convincingly fake that they are laughing. And neither can we stop it on command. As everyone knows from experience, inappropriate laughter is often difficult to disguise and it can easily get out of control.

Consequently, laughter cannot be seen as a voluntary activity, but neither can we think of it as an automatic physiological event triggered by some external stimulus. It is true that during exuberant laughing, our facial muscles stretch, we make a sequence of rhythmic expiratory sounds, tears stream and the body collapses, our physical existence seems completely disorganized. The interesting thing however is that it is not my body, but it is *me* who laughs – laughter is a meaningful activity. People laugh *about* something and they do it for a reason. One may ask why somebody is laughing, but it would be unorthodox to ask why somebody is sneezing,
or yawning, or coughing. An outburst of laughter can be deeply revealing about that individual's personality.

In addition, the reasons for laughing can be pretty sophisticated, as is illustrated in one of our earliest cultural narratives about laughter. In the Book of Genesis, God promises Abraham, who is one hundred years old at the time, that his wife Sarah will soon give birth to a son. Upon hearing the news Abraham falls on his face, laughing. Later on three angels approach Abraham in his tent and promise that Sarah will have a baby in the next year. Now it is Sarah who laughs, asking how she, old as she is, can still become a mother. The Lord then asks whether Sarah believes that there are things impossible for God. And Sarah becomes afraid, the Bible says, and denies having laughed at all.

Sarah's reasons for laughing are highly complex. According to philosopher Agnes Heller, who mentions Sarah's laughter in her study on comic phenomena (Heller 2005), Sarah does seem to laugh at God first of all, but by doing so she is also personally implicated, she also laughs at herself. Her laughter expresses not just a simple lack of faith in God's promise, but it is perhaps even more a laughter of self-irony, embarrassment, impossibility. The story indicates that there may exist a close relationship between laughter and a sense of incomprehensibility, even absurdity. Whatever it might have been exactly that made Sarah laugh – disbelief, doubt, or despair – there definitely was a lot of lucidity in her laughter (ibid., 29)

So at least we may say that some instances of human laughter can be complicated phenomena, involving mind, body and soul. For many philosophers, this complexity is efficient proof that laughing is a uniquely human capability, and that pondering on laughter is likely to give us some insight into what kind of persons we actually are.

**Panksepp's laughing rats**

Recently however, a number of scientists have argued that the capacity to produce laughter is not exclusive to human beings, but exhibited as well by other mammals. In his book *Laughter: A Scientific Investigation* (2000), the American psychologist Robert Provine defends the claim that contrary to popular belief, laughing is not about humour, it is about instinctive social bonding. The sound of laughter is a social play vocalization, and as such, a laughter's stimulus is not a joke, but the presence of an animate other, Provine says. Chimpanzees, orangutans and other mammals laugh in social conditions like rough-and-tumble play, chasing
games or tickling. The fast and breathy vocalizations that they produce during play or when being tickled, have more than a passing resemblance to the laughter humans produce. The difference is merely that apes and other mammals vocalize as they inhale and exhale, whereas humans laugh during exhalation only, in the same way we do it during speech. In Provine’s view, the evolution of bipedality in human ancestors freed the thorax and uncoupled breathing from running, providing humans with the typical flexible breath control required for both laughter and speech. His thesis is that human laughter is unusual in solitary settings – you cannot tickle yourself – and that it evolved from the ritualized panting sounds of our ancient primate ancestors during playing. It is literally the sound of play, a signal that reveals us as social animals, with the primal ‘pant-pant’ becoming the human ‘ha-ha-ha.’

According to Jaak Panksepp, a psychologist and neuroscientist at Washington State University, laughter is a capacity that can be found not only in primates but in non-primates too. Panksepp discovered that even rats can laugh (Panksepp 1998). In a groundbreaking article, he and his colleague Burgdorf describe how, in a systematic study of non-human tickling, rats respond to finger strokes of their belly with ultrasonic play vocalizations that may be the rat’s equivalence to human laughter. The play – and tickle-induced ultrasonic vocalization patterns (50 kHz chirps) in rats cannot be heard with the unaided human ear, but they seem to signal a readiness for social encounter. The rats that chirped the most were also the most playful, according to the authors. During the experiment, Panksepp’s hand was accepted as a playmate and the rats were returning to it time and again for more tickling (Panksepp and Burgdorf 2003).

Panksepp and Burgdorf point out a number of reasons for the hypothesis that such rat vocalizations reflect a type of positive affect that may have evolutionary relationships to the joyfulness of early human laughter accompanying social play. According to their theory, rats, apes and humans share homologous brain circuits that generate basic emotional feelings, e.g. rage, distress, care, lust and playfulness. The sources of play and laughter in the mammalian brain are instinctual. Play is about physical touch, both touching others and being touched, which is the essence of being a mammal. Laughter by tickling evolved as a way of cementing the affective bond between parents and children, thereby laying the foundation for a behavior that then be passed on as a useful social trait for adult mammals. The sensory capacity of detecting other animals and the associated defence of the body boundaries that are exercised in early play, must be widespread in animal life. Therefore it is to be expected that the tickling response will
also be found in non-primates such as rats, squirrels, cats, dogs and many other animals.

Their proposal is that tickle may be at the root of all play, in animals as well as in humans, triggering feelings of joy and playfulness in the young and of sexual arousal in adults. The human taste for humour is based in some fundamental way on the existence of this kind of infantile laughter. As we learn to tickle each other with words, we may be developing new synaptic connections to neural zones residing deep inside our brain, according to Panksepp. He believes that rat laughter and infantile human laughter do share enough evolutionary relations for the former to be useful in decoding one of the great mysteries of human life – the genesis of pleasure and joy.

So it seems as if we ran into a dilemma here. From a philosophical point of view, human laughing about jokes, comedy, irony, or absurdity (as in the case of Sarah in the Old Testament), seems to have nothing in common with the chirping noises that rats make in Panksepp’s laboratory in response to tickling. It looks as if the difference could not be any larger. Sarah’s laughing was characterized by disbelief, embarrassment and possibly a number of other self-reflective states that rats obviously do not dispose of. So why take Panksepp’s claim seriously at all?

On the other hand, Panksepp and other neuroscientists have compelling evidence to suggest that playfulness, and also rage, fear, lust, care, panic, are biologically basic affects that derive from architecturally and chemically distinct circuits, hard coded into the subcortex of the mammalian brain at birth. They function in a similar way in humans as they do in non-human mammals. Laughter, as an expression of the social play system, seems to derive from the same causal mechanisms in animals and humans. Rats may not have a sense of humour or comedy, but just like human beings, they do appear to have an enormous sense of fun and play, as Panksepp puts it.

In the next sections, I will make an attempt to reconcile Panksepp’s claim that rats can laugh with the idea that laughter is uniquely human, as many philosophers have argued. I will show how Plessner’s philosophical explanation of human laughter as a boundary phenomenon provides us with arguments to develop a strong case in this regard. It is true that Plessner stresses that laughing (and crying) “in the full sense of the words” are uniquely human phenomena. However, as I will argue, a thorough reading of his hermeneutics also provides us with the instruments to distinguish different sorts of laughter and to build bridges between self-conscious human laughing and the vocalizations of rats, chimps and little children in tickle and play.
Plessner's hermeneutics of human laughter

Plessner starts his analysis of *Laughing and Crying* (1970) with an intriguing claim: “Laughing and crying [...] are forms of expression which, in the full sense of the words, only man has at his disposal” (1970, 24). He then continues: “The statement that evidently only man has laughing and crying at his disposal, but not the lower animals, states no hypothesis which can one day be disproved by observation, but a certainty.”

Right from the beginning, Plessner criticizes the idea that humans are uniquely characterized by “rational” activities such as speaking, thinking, and long-term goal-directed acting. In his view, “bodily” experiences, such as laughing and crying, should be counted amongst the human monopolies as well. A creature without the possibility of laughing and crying is not human at all, according to Plessner. Therefore, any attempt to explain laughter (and crying) in terms of archaic reactions and to reduce them to elementary drives for shelter or communication misses the point completely, in his view.

With “laughter in the full sense of the word,” Plessner obviously does not refer to tickle and play situations. He is instead referring to laughter as it is related to the comic, to wit and humour, and also to embarrassment and despair (Plessner 1970, 194). What characterizes these specific occasions is that they generate a laughter that is simultaneously experienced as a loss of rational self-control, and as a meaningful response to the situation. When we burst out into laughter after hearing a really good joke, normal functioning is temporarily interrupted and an objective manipulation of the situation is over, Plessner says. The laughter breaks out *eruptively*, runs its course *compulsively*, and lacks definite symbolic form (Plessner 1970, 25). It is closer to an inarticulate cry or to a bodily reflex, than to disciplined speech. Yet, laughing remains the one and only true answer we can give to the funny situation.

For Plessner, the underlying question runs as follows: how should we understand that an articulate human being who in normal conditions can control his bodily expressions, falls into an automatic bodily reaction as soon as he “gets” the punch-line of a funny joke? How can we explain an automatism that shakes us so thoroughly, and yet is so much more than merely a bodily reaction? Neither the dualistic vocabulary of materialistic science, nor that of idealistic phenomenology can give a satisfying answer to this question, Plessner emphasizes. What this type of laughter points out is “the secret composition of human nature” itself. To explain the puzzle of laughter, we need a hermeneutic analysis that takes into account the human being as a whole.
Plessner’s naturalized hermeneutics is based on the notion of *eccentric positionality*, as a constitutive principle of human behaviour. Man *is* his body and he *has* his body as a physical thing. He is living in two different orders, as he famously claims. Human life is constituted by having to find an arrangement with respect to this relation between being a body and having it. It is precisely this ambiguous structure of human existence that can explain how it is possible that man, as an intellectual being, can lose his relation to his own body in something as characteristic as laughing.

In Plessner’s view, only beings that have self-control can lose it and surrender to the body in this way. Laughter happens when a situation confronts us with a multiplicity of meanings so that we feel immobilized among the abundance and don’t know what to do. When the direction is missing in which we must organize ourselves as eccentrically positioned human beings, we give up the directed relationship to our environment, the body slips away and we laugh. But while the body takes over the answer, the person remains intact as a person, Plessner writes (1970, 33). Laughing is a meaningful reply. The unique experience of the brokenness of man’s relation to his body during laughter exemplifies how fundamentally human corporeality differs from animal embodiment.

We tend to laugh in situations that are ambiguous or incongruous, yet not in such a way that it harms us, according to Plessner. If the ambiguous situation is also serious, posing a real threat to our well-being, we do not typically laugh. Instead, we are liable to panic or even lose consciousness. In non-dangerous situations however, especially if we cannot respond to the situation by means of words or actions, gestures or emotional expressions, we let ourselves go, automatism comes into play, and we laugh. Thus, laughter is the inarticulate, disorganized, yet intelligent expression of a boundary situation.

**Tickling babies**

An interesting implication of his hermeneutic approach is that Plessner has to make a sharp distinction between the eruptive, compulsory laughter at wit, comedy and humour, which he analyzes as a breakdown of the control a person has over the body, and other forms of laughter-like behavior such as giggling, smiling, laughing out of joy, laughing in play and after being tickled, polite conversational laughing, and social laughing. In all these sorts of laughter, there is no breakdown in the sense that the active directedness to the environment is maintained.
Plessner is obviously interested first and foremost in the more dramatic forms of human laughing. This may explain why he has many interesting things to say about humour and comedy, but relatively little about the laughter of babies and little children.

Of course, developmental psychologists would be inclined to see the different forms of laughing as different only in degree and not in kind, with eruptive laughter at comedy and jokes on the more sophisticated side of the spectrum, while the polar opposite is in uncomplicated laughter of babies in tickling or little children playing. Scientists who specialize in the ontogenesis of laughter tell us that babies start to smile in their second month and that they first laugh at about four months of age, their laughing being a way to interact with the mother and other caregivers. The incidence of laughter becomes more frequent later on, as do the varieties of occasions that elicit it. According to psychologist L. Alan Sroufe, the laughter develops from being a response to direct physical stimulation, toward smiling and laughing in response to a remote stimulus. One-year-olds laugh most at items that provide an obvious element of cognitive incongruity – mother sticking out her tongue, or playing peekaboo. Older babies seem to love the unpredictability of a situation like this so much that they begin to take an active role in the production of it. According to Sroufe, the development of laughter goes hand-in-hand with the development of the capacity to coordinate different tactile, auditory and visual schemata. Humans laugh most often during early childhood, and the most abundant laughter occurs during rough-and-tumble play and as a result of being tickled gently (Scroufe 1996, in Prusak 2006, 45).

The interesting thing is that the occasions that elicit laughter from babies and small children in tickling and play all seem to have certain characteristics in common. First, they all present an incongruity – a characteristic that certainly holds for tickling, which is an ambivalent form of contact that is at once repulsive and attractive, potentially threatening and comfortable. Secondly, when a child is confronted with an incongruity, she stops whatever else she was doing and a bodily tension builds up, which is necessary in order to release subsequent laughter. Thirdly, the need for tension relief alone can never provide a sufficient explanation for laughter, where the tension leads to depends on a further characteristic, namely the child’s evaluation of the one who tickles. How the person that tickles her is perceived and valued can make the whole difference between a ticklish delight and an ordeal (Provine 1999, 100). Consequently, whether the stimulus of laughter is effective depends on the relationship with the tickler as much as it depends on any of the movements that he makes with
his hand. Laughing due to tickling and play is always an expression of the one who laughs, and not merely a bodily event.

In this respect, the laughter of little children has a lot in common with the laughter of rats, as Panksepp and Burgdorf point out. The chirping reaction of rats is a meaningful response as well. A video on YouTube with Panksepp’s laughing rats shows that these laboratory rats really enjoy being tickled because they socialize with the hand that tickles them. What the video makes clear is that tickle involves more than the sensory physiology of touch and the physical properties of the stimulus – not just anybody, in any circumstance, can make rats laugh by tickling them.

A fourth characteristic therefore is that from a psychological point of view, laughter is always social. This is in sharp contrast to crying, which is a solitary activity most of the time. From childhood, we learn to laugh at incongruities in a social context. We laugh at others and in the company of others, signalling friendly intentions and the feeling that we are part of a group. Laughter is contagious – even in the case of tickling, when children laugh together with the person who tickles them. As Panksepp and Burgdorf suggest, we may assume that the whole puzzle why one cannot tickle oneself may be due to the fact that the underlying neural systems in the tickling response are controlled by social cues and social interactions – the perception of being wanted/chased as well as the predictability/unpredictability of the resulting social interactions (Panksepp and Burgdorf 2003, 542).

The social function of laughter in play and in situations of tickling is likely to be positive, but can also be negative at times. Children laugh not only with others, but also at others, trying to force them to conform or to cast them out of the group. In adulthood we make jokes on those who obviously fail to meet the requirements of the social rules. Laughing can be used as a tool to reinforce a group’s solidarity by devaluing outsiders – humans often laugh together from a position of moral power and superiority, which is probably one of the reasons why laughing has never been very popular in philosophy. Plato, Aristotle and Hobbes noticed correctly that we have a bad habit of laughing at those who don’t fit in the group, or at the misfortunes of others.

A first conclusion we can draw might be that certain “family resemblances” (Wittgenstein) hold between the behavior of rats producing ultrasonic vocalizations while being tickled, the expressive sounds produced by babies and little children in tickling and play, and the eruptive laughter adult human beings produce at hearing a joke or watching “the world’s funniest home videos.” Together they represent a heterogeneous collection of states that have various degrees of similarity to each other. The similari-
ties explain why both ordinary and scientific language users easily refer to these analogous behaviors with the general and unspecific term “laughter.”

A second conclusion might be that the common features of different sorts of “laughter” – the perception of incongruity, the built up of bodily tension and its relief, the process of evaluation, the mechanism of social inclusion – provide compelling evidence for the claim that the human taste for humour is indeed based on the existence of childhood joy and laughter in humans and other mammals. The first joke, the first action to produce a laugh without physical contact, probably was the feigned tickle, the same kind of movement parents make when they play with their babies.

**Eccentric animals that can laugh**

The reasons why Plessner focussed in *Laughing and Crying* (1970) on what we might call the more dramatic instances of laughter – laughter as a crisis, an uncontrolled eruption – may have become clear by now. His purpose was to understand laughter in its typically human aspects, as a meaningful answer that is at the same time a loss of orientation, a fall into the body. From the point of view of philosophical anthropology this is the real mystery of laughter, because this would never occur to non-human animals. It is precisely here that human corporeality appears to differ fundamentally from animal embodiment.

In spite of many remarks that seem to prove the contrary, I don't think that Plessner’s point was that laughing – in a more general sense of the word – should be denied to creatures such as little children, babies, or even chimps and rats. In *Laughing and Crying* he explicitly acknowledges that there are different sorts of laughter, being on a curve which “stretches from the mediate occasions of boundless joy and titillation to the boundary situations of embarrassment and despair. The top of the curve, which is correlated with the occasions of the comic and of wit and humour, indicates laughter in its full development” (Plessner 1970, 113).

Therefore I assume that Plessner, if he were still alive, would readily admit that the behavior of chimps and rats while being tickled, shows interesting similarities with the behavior of babies or little children and that tickling is probably the closest we get to the laugh-inducing snatching and grabbing of our ancestors. He would easily join Panksepp in his conclusion that although laboratory rats lack a sense of humour, they do appear to have a sense of joy and fun. He would probably even agree with V.S. Ramachandran that a possible evolutionary explanation for the emergence of fully developed
human laughing might be that the individual is alerting others in the social group that the incongruity he detected is of trivial consequence, that there has been a false alarm (Ramachandran 1998, 352).

Neither would Plessner, in my view, object to the claim that most laughter in the human world is not about humour or wit, but about the relationships between people. Most of the time, laughter takes place in ordinary daily conversations, it is about things that are far from what one might call funny. Most laughter does not follow jokes or slapstick. It is a sort of social glue that bonds relationships, a kind of polite, artificial laughing, e.g. when your boss is making a speech. No doubt, Plessner would agree with Provine that most laughter happens during the pauses between the words, and that it seldomly interrupts breath or the sentence structure of speech in all entirety.

Yet, there are instances where it does exactly that. Sometimes we burst out into laughter when we hear a funny joke, in the process of which our body becomes alien to us. “We understand we are arriving at a boundary [...] our laughter is an embodiment of the estrangement from our body” (Plessner 1970, 138). To clarify how this peculiar event is possible, we need to understand that man is living in two different orders: he is eccentrically positioned in his world, an embodied creature and a creature in the body at the same time. It is precisely man's ambiguous position that constitutes the basis of laughing. In Plessner’s interpretation, we are capable of breaking out into laughter because of our brokenness.

Therefore, the bottom line of Plessner’s investigations reads loud and clear that the eruption of the alien body in laughter cannot be reduced to some primitive animal forerunner. To the contrary, it should be seen as a triumph of man, a victory of the self, even in catastrophe. Eruptive laughter exemplifies what is unique to the human being. It is in the breakdown of organized behaviour that we actually experience how our reflective relation to ourselves has indeed an origin in human corporeality, as the Dutch philosopher Maarten Coolen says (Coolen 2008, 165). In losing control over his body, man still attests to his sovereign understanding of what cannot be understood, to his power in weakness, to his freedom and greatness under constraint (Plessner 1970, 67).

Consequently, Plessner’s hermeneutics testifies to a strikingly original understanding of man and his place in nature. It presents man not as a rational animal, actively controlling the machine of his body, but as an ambiguous creature, living in a condition of instability. Precisely when the body takes over, he asserts himself as a person and proves his humanity. Or to summarize it concisely: Plessner presents man as the eccentric animal that can laugh.
Bibliography


