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A UNIFIED THEORY OF HUMOR AND ITS EVOLUTION

by

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**Table of Contents**

Introduction.....	5
I. Play, Laughter, and Incongruity.....	7
II. Superiority, Aggression, and Disparagement.....	18
III. Health, Catharsis, and Stress Relief.....	31
IV. Sexual Selection, Creativity, and Humor.....	45
V. A Unified Theory of Humor and Its Evolution.....	58
Conclusion.....	72
References.....	75
Appendix A: Figures.....	84
Appendix B: Jokes.....	86

## Introduction

Two men are walking through the forest, when they come upon a large, deep hole in the ground. The hole is so deep and dark that they can't see the bottom. So, they find a rock, throw it into the hole, and listen for it to hit the bottom. They wait – but there is no sound. So they go and find a bigger rock and throw it into the hole – still, no sound. Finally, they drag an old railroad tie to the hole and throw it into the hole – and still! No sound!

All of a sudden, a goat comes running at top speed and dives head first into the hole... And still, no sound! The two men look at each other in surprise, but before they could say anything, a farmer comes walking out of the woods and asks them, "Hey have either of you seen a goat around here?"

"Well actually," one of the men says, "A goat just ran by here at top speed and dove into this here hole."

"No, that couldn't have been my goat," replies the farmer, "My goat was tied to a railroad tie."

(Adapted from *A Prairie Home Companion* with Garrison Keillor )

Humor is one of the most pleasant aspects of the human experience. It entertains, relaxes, and brings joy. Human beings love to laugh. Yet, surprisingly little is known of how exactly this complex human behavior came into existence. Over the years, humor theorists have examined each of the major facets of humor individually. Play and incongruity, superiority, and health are all elements of humor upon which potential explanations of the subject have been based, but while each of these topics has been studied in depth by itself, they have very rarely been combined. This paper seeks not only to survey and explore each of these areas, but also to combine these varied disciplines together with the theory of evolution to attempt to better resolve where, when, and how in evolutionary history humor arose.

It is important to note that this paper is examining the evolution of *humor*, not the evolution of *laughter*. Humor is the psychological feeling of pleasure, entertainment, and stress relief that is caused by certain external factors (to be discussed at length later in this paper). This is very different from laughter, which is an instinctive mammalian signal characterized by loud whooping noises, spasms of the diaphragm, and choppy breathing

that can be sparked by humor, or any number of other stimuli including nervousness, fear, play interactions, tickling, or psychological illness. While laughter frequently coincides with humor, it is simply a signal and reaction. It is the result of humor, but not its cause.

The first four chapters of this paper will explore the background of three of the most important components of humor (incongruity, superiority, and relief) before moving on to examine the popular theory of the health promoting properties of humor and the relationship between creativity and humor. The first chapter will also consider play and the importance of a playful atmosphere to the production of humor. Chapter IV will consider the ways in which creativity has affected humor and helped select for its survival. Finally, chapter V will bring together all of these vastly differing elements to propose a unified theory of the evolution of humor.

## **I. Play, Laughter, and Incongruity**

Two ingredients are necessary before humor can occur. An element of incongruity must be introduced into an environment marked by playful intent. While in later chapters the factors of superiority and stress relief will be demonstrated to be significant contributors to the effect of humor, each of these is insufficient without the presence of incongruity and playful intent. This chapter will explore how playfulness and incongruity create the foundation and basic structure of humor, preparing the way for a deeper exploration of the function and origin of humor.

The first ingredient necessary for humor to occur is that of playfulness. The situation in which humor arises need not necessarily be itself playful, as when humor is used to mock a competitive rival or when it is used to relieve the tension of a stressful situation, yet playfulness must be communicated in some way by a jovial countenance. Without an element of playfulness, a jibe at a rival's expense is merely an insult and a joke intended to defuse a tense situation will have little effect on the situation. In short, without a context of play, humor cannot exist (Fry Jr. & Allen 1976).

While the concept of play may seem inseparable from that of humor, it is important to consider their relationship as a means to divining the origin of humor. Play is a costly endeavor in terms of time, attention, and metabolic energy. Such a significant use of resources can only arise in an organism which has adequate reserves to devote part of its assets to such a venture. Such species must be somewhat released from the bonds imposed by simple survival. Such an environmental opportunity arises in species which possess long periods of childhood and parental care and is a hallmark of mammals

(Koestler 1964). This proposition does indeed follow through, as it is the younger animals of a species that are observed to spend the greatest periods of time involved in play. Adult animals seldom participate in play activities, and are observed to partake only on occasion and only after significant prodding by a young animal (McGhee 1979).

Such a significantly costly activity as play is unlikely to have arisen without significant evolutionary benefit. Play-like behavior has been observed in all mammals as well as many bird species and it seems that, in general, play becomes more frequent, complex, and organized in long-lived organisms with extended juvenile periods (McGhee 1979). This trend can be observed particularly with regard to cognitive complexity, as indexed by cerebellum size. A 2004 paper by Lewis and Barton examined this relationship via a comparative analysis of social play incidents and cerebellum size in nonhuman primates. The results demonstrated a clear positive correlation between amount of social play and cerebellum size. This fact seems to indicate that social play may not only require that an organism's cognitive and motor responses both be highly developed, but may also serve to help integrate them (Lewis & Barton 2004). One common argument for the evolutionary value of play is that it is a means which young members of a species utilize during their period of parental protection, when survival threats are reduced, to practice and develop physical and cognitive skills that they will later need to survive and reproduce on their own (McGhee 1979).

Play behaviors which are imitative of critical survival and reproductive behaviors are apt to cause confusion, distress, or violence if they are mistaken for more aggressive actions. Thus, play signals are indispensable to the proper use and functioning of play

and are utilized by most animals which engage in social play (McGhee 1979). These play signals serve to communicate to those observing or others participating in the interaction that the behavior is only play and should not be taken seriously (McGhee 1979). Without such signals, behaviors such as mock-fighting, chasing activities, and biting could easily get misinterpreted as actual assaults, causing their recipient to defend themselves and leading to a dangerous snowballing effect. Two particularly relevant examples of play signals which are shared by humans (and in related forms in other high-order primates) are smiling and laughter (McGhee 1979). Together, these indicators provide both visual and auditory signals that their producers are not serious in the other actions which they may be performing. These signals of play intent are also particularly notable as they are the same responses which are garnered as a result of the effective use of humor.

One staple of human social play, and one which produces copious amounts of laughter and smiling in both participants, is that of tickling. The most ticklish areas of the body, and consequently those most likely to be targeted by a tickler, are also the areas of the body most vulnerable to physical attack. These areas are equipped with large numbers of nerve cells and include the abdomen, the armpits, the joints of limbs (i.e. the insides of knees and elbows), and the neck. This makes sense if tickling is seen as a form of practice for fighting. If an individual is able to make contact long enough to tickle an area which is vulnerable to attack, then they would also be able to cause damage to that area. Indeed, victims of tickling react as if they actually were being attacked, squirming away from their attacker and attempting to bat away the offending limbs. However,

thanks to the presence of the requisite play signals, the ticklee knows not to be distressed, as this is not a real attack (Gregory 1924). Individuals find this behavior rewarding, as even if they manage to escape, they will quickly return to the fray and attempt to exact reciprocal revenge on the tickler (Provine 2004).

It is important to note that while tickling produces smiling, laughter, and pleasure, it is also rather uncomfortable, and does not necessarily produce true humor in its victims (Gregory 1924). While not exactly painful, being tickled would also not be described as a pleasant sensation. However, this seems to be a perfect sensation to accompany mock-combat. The discomfort involved with a successful tickle attack, spurs one to end the attack as quickly as possible and to deflect further attacks in the future. If there were no penalty for failing to defend oneself there could be little lesson in the game. Further, with regard to humor, while tickling may not actually be producing fully formed humor, it demonstrates a truly significant intermediate step as it associates smiling, laughter, and some degree of pleasurable feelings with a basic perceptual discordance – “I am being attacked, and yet I am not being attacked.”

Indeed, in this way, playful tickling demonstrates a basic incongruity. A possible evolutionary explanation can be found in the proposition that the first forms of humor were based on nonverbal playful incongruities such as this. In fact, simple visual incongruities are one of the earliest stimuli to provoke humor in young human children (McGhee 1979). As man’s ancient predecessors developed language, a different form of this incongruity would likely have emerged to take advantage of early man’s growing ability to manipulate symbols and nonexistent images and objects. This new form draws

nearer to the modern form of humor seen most often today, that of oral jokes, riddles, and jibes. A critical step toward humor as it is recognized today seems feasible in the extension of basic physical play forms of incongruity into the verbal and conceptual realms (McGhee 1979).

Almost every theory about humor has some basis in incongruity (Holland 1982). The perception and recognition of an incongruous situation, event, or relationship (anything which is interpreted to be ridiculous, unanticipated, improper or dissonant with the given context) seems to be necessary in order for humor to take place (McGhee 1979). The humor stimulus can be something as simple as a straightforward statement of a discrepancy. Incongruity can also be found in the differences between values, both within the same and among different cultures. As discussed above, one basic form of incongruity is something which at first appears harmful, but which then reveals itself to be quite harmless. This is also known as Aristotelian formal incongruity (Holland 1982).

As alluded to above, incongruity-based humor can be conceptualized as a type of intellectual play via manipulation of symbols and concepts as allowed by increasing levels of intelligence (McGhee 1979). When primitive humans first achieved the ability to create and manipulate symbolic and nonexistent objects, their capacity for incongruity, and therefore humor, greatly increased. As early as age 2, human children begin to appreciate humor as a result of incongruity. This often takes the form of laughter at deformed or oddly featured individuals, silly faces, odd or socially inappropriate noises, or any outward situation which does not seem to fit. Much adult humor is drawn from the application of alternate meanings to a key word or phrase in an anecdote or joke. A

common example of this can be found in simple puns, wherein the entire joke is found in the vastly different and often logically incongruous meanings applicable to the same word. The more common and probable meaning of the word is realized first, establishing a starting point from which to then consider the less probable, but also applicable meaning of the word. In the process, the individual recognizes the incongruity of applying the less probable word and the unlikelihood that it would contribute to the meaningful statement which results. But, to his surprise, this strange construction somehow does. (McGhee 1979).

Incongruity theory proposes that it is the individual's intellectual reaction to this incongruity that leads to humor. Humans have evolved in accord with the logic of our universe and have come to expect certain patterns, events, and properties of objects. Humans understand the general rules of how people reason, that time only goes forwards, and the basic laws of physics. When something does not fit these expectations or violates these rules, it causes humor. The incongruity theory of humor is not new, first being suggested by Aristotle; In *Rhetoric* he notes that one way to produce humor in an audience is to guide them towards one conclusion and then to suddenly introduce something unexpected to them (as discussed in Morreall 1983). He would abandon this theory in order to focus on his superiority theory of humor (discussed in chapter II of this paper). Little other academic effort was exerted toward the advancement of incongruity theory, with the exception of work done by Kant and Schopenhauer who both examined the subject during the 18<sup>th</sup> and 19<sup>th</sup> centuries (as discussed in Morreall 1983).

The modern incarnation of the theory essentially asserts that humor is caused by a dissonance between one's perception and one's cognitive understanding of that perception (Morreall 1983). Humans' knowledge of the world and its rules allows them to recognize an incongruous situation when they see one. The incongruous situation presents a challenge to humans' understood logic. However, application of standard rational thinking will not work with humor. Humor operates on a logic all its own. The incongruities which are produced are intentionally absurd and lacking in traditional logic. However, it is theorized that it is the intellectual activity involved in producing and decoding the illogical incongruities which generate the enjoyment and satisfaction of humor (Ziv 1984).

An example of an incongruity in action can be found in this example: "How far can a dog run into a forest?" – "Only halfway. After that he will be running out of a forest" (Rothbart & Pien 1977 p.37). The original question seems simple enough, if a little puzzling. The presentation of the punch line, however, introduces both the incongruity of the joke and its resolution. Both the original question and its answer were meant to be taken literally. Though incongruous with the way in which questions are normally asked, the reinterpretation of the riddle completely resolves the incongruity and arouses humor. However, the incongruity need not necessarily be entirely resolved to a meaningful result. Other incongruities may be induced, thus, further adding to the humor of the situation. For example, "Why did the elephant sit on the marshmallow?" – "Because he didn't want to fall into the hot chocolate" (Rothbart & Pien 1977 p.37). An initial unlikely situation is proposed. The humorous punch line does indeed explain why

the elephant wanted to sit on the marshmallow, but it still leaves many other, greater incongruities untouched. An even more complex example can be seen in this joke: “Why did the cookie cry?” – “Because its mother has been a wafer so long” (Rothbart & Pien 1977 p.37). This riddle presents the incongruous image of cookies that can cry and have mothers, the cognitive challenge of answering the question, as well as a pun, resulting in a combination of words (“a wafer”) which only resolve themselves by their sounding similar to another pair of words pronounced in a certain manner (“away for”) (Rothbart & Pien 1977). One of the most well known jokes provides an example of a further application of incongruity: “Why did the chicken cross the road?” – “To get to the other side.” This joke utilizes principles similar to those seen in the first example. However, it also plays off of the growing expectation of listeners for there to be a surprising incongruity. After several moments of trying to puzzle out what the witty answer might be, they are surprised to find that the answer does not utilize humor’s alternate logic at all. Thus, one part of the humorous incongruity of this classic joke is that there is no incongruity, therefore presenting yet another incongruity.

In 1964, Koestler coined a term to refer to the process of incongruity recognition described here. This term is “bisociation” (Koestler 1964 p.36) - the perception of “a situation or event in two habitually incompatible associative contexts” (Koestler 1964 p.95). This term expresses the manner in which the listener of a joke’s train of thought is suddenly shunted from one plane of logical thought to another, thus creating something new while at the same time allowing for the reconciliation of the cognitive incongruity with more typical logical thought. Koestler, too, argues that this bisociation of

sometimes vastly incongruous and unrelated concepts underlies all forms of humor (Koestler 1964).

Several studies have examined the ability of bisociative incongruity to result in humor. One study examined whether children would laugh at simple visual discrepancies in a Piaget-based water conservation demonstration. In this type of demonstration, two beakers are filled with the same amount of water. Then one beaker is poured into either a taller and thinner or a shorter and wider beaker. Until a certain age, children will believe that the amount of water in the new beaker has changed (either increased or decreased) while it has actually remained the same. Children who had not yet developed an understanding of this property of matter smiled and laughed more at the demonstration than those who had developed an understanding of conservation. Presuming that in this case the children's smiling and laughter were accurate indicators of genuine humor, this finding seems to support the proposition that discrepancy incongruity is indeed humorous, as the supposed sudden change in the amount of water present would constitute an unexpected and incongruous event (Rothbart 1976). A pair of papers by Nerhardt (1970) and Deckers and Kizer (1974) found that when feeling weights of different masses, but similar appearance with regard to size and shape, participants would not only smile and laugh when feeling a surprisingly discordant weight, but would also smile and laugh in correlation with the degree of difference between the weights (Nerhardt 1970; Deckers and Kizer 1974). This finding provides further empirical evidence for the natural humor of incongruity.

However, while incongruity is indeed a vital component of humor, it remains dependent on the existence of a playful atmosphere in which to operate. The message that “this is a joke” remains extremely important (Rothbart 1976). There can exist a fine line between the amusing and the terrifying. Sudden incongruity, such as a man slipping on a banana peel and falling, is funny when it occurs in an atmosphere of joviality, such as while watching a comedy film. However, a man slipping on a banana peel and falling is much less humorous when he is your climbing partner and you are attempting to traverse a narrow, slippery, and precipitous mountainside. The dynamic between humor and fear can be observed in a child on a swing. When the swing is drawn back, and the child realizes and begins his descent, his eyes widen with fear – he is falling! But as the trajectory of the swing pulls him away from the ground, his fear is quickly relieved and laughter and humor pour forth. Relief is another property of humor, stemming from incongruity, which will be discussed in chapter III. A scenario similar to this one can be seen in individuals’ reaction to a rollercoaster or a carnival’s haunted house (Rothbart 1976). This is true of any arousing occurrence. A strange mask will cause fear or shock in a threatening context, but in a clear absence of threat, the very same mask can inspire peals of laughter (McGhee 1979). Without an atmosphere of play, incongruity will be surprising or frightening, but not funny (Morreall 1983).

In addition to an atmosphere of play, incongruity, though a necessary element, is often insufficient for humor production. Though some humor can be derived from pure incongruity, often other elements are used. In common usage, incongruity is really only the bare bones of humor (McGhee 1979). Further humor is derived from the additional

layers of disparagement, stress relief, and creativity in humor production. As will be discussed in the next chapters, this newfound ability to play, via bisociation and incongruity, permits humor's application to the disparagement of enemies and rivals, the reduction of threat caused by outside stressors, and even the courting of mates.

## II. Superiority, Aggression, and Disparagement

Despite tracing its roots into the blithe realm of pleasurable stimulation, playful practice for adult life, and the simpering silliness of simple incongruity, most investigations into the mechanics of humor have focused on much more devious properties. One of the oldest and most popular theories of humor is that of superiority, aggression, and disparagement (Morreall 1983). For much of recorded history, humor has been seen as a seemingly pleasurable but deceptively malevolent behavior feeding upon aggression, envy, and spite (Chapman & Foot 1976).

The ancient Greek philosophers were first to attempt to explain the significance and workings of humor. Plato asserted that the perception of weakness in another was the source of humor and that laughter constituted an attack on that weakness and, by association, upon the individual harboring said weakness (as discussed in Ziv 1984). In the Socratic dialogues of *Philebus*, Plato endorsed taking pleasure in the misfortune of ones enemies (as discussed in Zillmann & Cantor 1976). However, he did caution that in heavy laughter, one loses rational control of oneself, and in doing so, becomes for a time less than fully human (as discussed in Morreall 1983).

Aristotle agreed with Plato regarding the derisive nature of humor (as discussed in Morreall 1983). In *Poetics*, Aristotle also alleged that weakness was the source of humor, demonstrating an assessment in accord with Plato's (as discussed in Zillmann & Cantor 1976). Further, Aristotle claimed that this laughable weakness also made a person ridiculous, ugly, and repulsive (as discussed in Ziv 1984). Aristotle noted that due to the unpleasantness associated with being the butt of a joke, humor might be used as a means

a reining in social misfits or defectors in the social contract (as discussed in Morreall 1983). The Romans Cicero and Quintilian agreed with the notion of humor's origin lying in weakness and cited humor as a type of behavior which men of class and civilization should avoid (as discussed in Chapman & Foot 1976).

This view of humor has persisted and is the starting point for many modern theories of humor. Modern theories now have much more knowledge of the origins and history of humankind on which to draw on in the examination of humor as an aggressive and malevolent concept. The complex construct of humor most likely arose in an ancient common ancestor of man. Arising, as such, in the environment of evolutionary adaptiveness, the period when humans were adapting to their modern form, humor would have had to have been quite important to the organism's all important duties of procuring food, shelter, and mates (Gruner 1978).

Given the vestiges of laughter and the potential humor seen in modern primates, it seems reasonable to infer that the beginnings of humor evolved relatively close to the time of the last common ancestor between *Homo* and other primates. This being the case, humor would have had to have arisen prior to the evolution of speech and language (Gruner 1978). The debate over when in the evolutionary process human language evolved still rages and could provide fodder for an entire paper all its own. This makes it quite difficult to determine when precisely humor evolved. Therefore, for the purposes of this thesis, the unspecific designation of an ancient human ancestor, somewhere after the ape-hominid split, but before the development of language must suffice.

While it seems likely that humor had its basic foundation in the tickling, play, and incongruity discussed above, some researchers focus on points later in the evolutionary timeline. Konrad Lorenz (1963) proposed that the humor signal of laughter evolved as a ritualization of a threatening movement in a process similar to that of a “triumph ceremony” he observed in geese (Lorenz 1963 p. 293). This dovetails nicely with a theory proposed by Gruner (1978) which provides a detailed conceptualization of how humor might have evolved into its current form. Gruner theorizes that humor and laughter evolved from the victory celebrations of prehistoric combat. His theory proposes that during combat a great deal of energy and adrenaline is aroused, particularly if the combatants are well matched. With the sudden arrival of victory for one of the combatants, the victor finds himself with an excess of energy and stimulation. He bares his teeth, assumes a fitting grimace, and releases a primeval victory shout of chopped breath, speeding his return to physiological and psychological homeostasis, avoiding waste of unused energy, and signaling his dominance in the conflict (Gruner 1978). In preserving this trait, natural selection would affiliate positive emotional feedback with this primitive laughter behavior, thus resulting in the basis of humor.

Further, Gruner claims that the loser in the described combat would release his pent up tension through a similar, though less exultant process – that of crying. This would release his excess energy, allow for his more rapid return to homeostasis, and signal acknowledgement of his defeat to the victor and to any observers, protecting him from any further immediate harm. Additionally, these proposed origins could explain the

striking similarity of laughter and weeping which lead to their occasional confusion (Gruner 1978).

While most humans today are not often involved in heated physical struggles for survival, their competitive instincts and evolutionary predisposition have been ritualized into business, sports, and violent video games. Some of these substitutes merely formalize aspects of the primitive contest. Examples include boxing, wrestling, and hunting. The growth of civilization and formalization of competition has resulted in more complex and established hierarchy and power structures (Gruner 1978). It is no longer appropriate to challenge the ownership of the corner office by physically fighting one's boss. Nonetheless, Gruner (1978) contests that this instinct to compete, win, and scream of one's victory remains inborn. The significance of this latent instinct in relation to modern humor will be explored later in this paper.

Gruner's theory also posits that ancient human ancestors became conditioned to recognizing laughter as the mark of a successful victor, and of tears and weeping as the sign of a defeated failure. Additionally, Gruner claims that human ancestors generalized the laughter reaction to include the mere sight of an injured, enfeebled or otherwise inferior person. What began as humor at superiority derived from success in battle became a generalized feeling of superiority above anyone with any deficiency or impairment or even anyone substantially different from oneself (Gruner 1978).

Though it is, of course, impossible to prove that this evolutionary tale is true, the schadenfreudesque principle it supports seems evident in much of mankind's humor. The jokes and teasing of young children are often viewed as being exceptionally cruel and

cutting by adults, as these youngsters see no need to restrain themselves from making light of their peers' mental deficiencies or physical deformities (McGhee 1979). Adults are more apt to mask their true reactions, thoughtlessly chiding children for their innocent laughter. Only as children develop and grow older do they begin to be able to see the effects of their mocking through the eyes of their victims, thus reducing the fervor with which they thoughtlessly hurl insults and verbal abuse (Morreall 1983).

However, the degree to which hostile humor is alive and well in modern culture is demonstrated by the fact that adults too find humor in the mental incompetence, physical deformities, and strange eccentricities of those around them (McGhee 1979). Who in today's world but the staunchest and most loyal Republicans would not find a sleight against President Bush's public speaking skills to be humorous? The fact that enjoyment can be wrung from the sight of a neighbor's misfortune, and resentment can spring from their success, serves as evidence of the malice inherent in humor (Zillmann & Cantor 1976).

The difference between the aggressive humor of children and adults lies in the fact that adults recognize the power that their laughter holds, and thus are slow to ridicule those around them in person. Adults usually mock from a distance and with a bit more sophistication and obfuscation of their derision than do children (McGhee 1979). While the more uncouth and base might find humor in the physical maladies and disasters of others, those of more class and education tend to instead find humor in more "refined" faults, such as deficits of a psychological or intellectual bent (Flugel 1954).

But indeed, herein lays an important point which has yet to be recognized in this discourse. What originated as a simple feeling of superiority when spotting a fault in another has been transformed, like so many other things, into a weapon. By creating humor purposely from the appearance, actions, or attributes of others, man has discovered an aggressive tool which can be used to attack nearly any enemy which may rear its head: human, environmental, or conceptual (Lorenz 1963). According to Gruner's theory, succeeding in humiliating a person or concept, by affiliating it with a theoretical (or actual) defeated foe, causes one to appear and feel superior to that person or concept, and to thus enhance his self in the process (Zillmann 1983). When one is able to reduce the power or status of another, the net effect is as if one has elevated themselves in comparison to that other (Ziv 1984). This is a critical shift; from merely observing and reacting to inferiority with humor, to pointing out or creating the observable fault, thus shifting more onus, and more of the benefits, onto the ridiculer.

Gruner's theory incorporates this critical shift into its framework as well. With the evolution of language, man was released from the time constraints which had previously bound his humor abilities. Events from the past, as well as speculation into the future, were brought under his command. This freed him from having to wait for the ridiculous to occur right in front of him, and allowed him to create humorous mockery on demand. Further, the abilities of language, when coupled with humor, allowed for faults to be magnified and exaggerated, so as to be many times more damaging to the butt of the humor, and thus garnering that much more prestige for its progenitor (Gruner 1978).

A story is related in Highet (1954), that in the middle ages, warring Arabs took with them into battle a satirist. This humorist would compose insulting, ridiculing poetry about the enemy, and during the battle would spout this satire from among the warriors on the front lines. This was said to take a significant toll on the enemy morale. After the battle, the satirist was granted the same glory and honor as afforded any other warrior who took part in the battle (as discussed in Ziv 1984).

Alexander (1986) comments on the purposes of using humor against others, noting that it can be used to elevate one's status, lower the status of another, elevate the status of a listener by permitting him to laugh and allowing him to rise in status relative to butt of the humor, and finally, by categorizing the butt of the humor as a member of a disliked or rival group. He notes that the pinnacle of derisive humor is to create a humorous attack which is not recognized by the butt of the humor. Further, he notes the ability of observers to mediate the effect of the humor on the teller's and their own reputations through their reactions. By refusing to laugh at a joke (however humorous or not it may be) an individual is, in a way, slighting the joker or perhaps demonstrating his own superiority and aloofness to the joke. However, if an observer laughs too hard at a humorous attack, it implies a desperate need to raise that one's own status, and thus can result in an actual loss of status (Alexander 1986).

These observations raise an important point. Why would one want to refuse to laugh, and thus slight the humorist? Perhaps it has something to do with the individual, group, or concept being disparaged. In most forms of hostile humor it is quite simple to identify the target of the joke. Humans find the most humor in situations where they hold

a favorable attitude toward the aggressive humorist and hold a negative attitude toward the victim of the joke. Mankind does not enjoy seeing the inverse, however – the humorous disparagement of a well liked party by a disliked or neutral one (McGhee 1979). For example, it would be quite unsatisfying and disagreeable for a story to end with the villain winning the hero's girl. If loathsome, unpopular athletes championed in sports, these normally enjoyable competitions would quickly become quite distressing. Certainly, these examples would be far from humorous. At the same time, seeing good events happen to well liked individuals is also not humorous. It is pleasing, but it is not funny. Further, negative personal traits such as unattractiveness, idiocy, and clumsiness become quite humorous when found in those who are disliked (Zillmann 1983). But having these traits pointed out in our friends or affiliated groups is far from pleasurable and certainly not humorous (Zillmann & Cantor 1976). Even the objects, items, and concepts affiliated with liked or disliked entities are affected by this property of humor (Zillmann 1983).

This principle can be qualified as follows:

“Let S believe J is a joke in which A seems to S victorious and/or B appears the butt. Then the more positive S's attitude towards A and/or towards the 'behaviour' of A, and/or the more negative S's attitude towards B and/or towards the 'behaviour' of B, the greater the magnitude of amusement D experiences with respect to J” (LaFave, Haddad, & Maesen 1976 p.66).

Essentially, the degree of humor that an observer will feel from viewing a humorous interaction will be based upon the observer's feelings toward the players involved in the situation. Of particular note is that humans will better enjoy humor which is directed against a disliked individual or party. They do not enjoy seeing their own affiliates or

friends slighted. Misfortunes and insults only inspire humor when they seem to happen to the “right people” (Zillmann & Cantor 1976 p.95).

In addition to affective preferences, aggressive humor is seen to be justified and is appreciated when it seems to be done out of retaliation. Take for example:

“...the clergyman who attacked an antislavery orator, saying, ‘You are an abolitionist, aren’t you? You want to free the slaves.’ ‘Yes.’ ‘Well, why don’t you go to Kentucky?’ To which the abolitionist replied, ‘You are a preacher, aren’t you? You want to save souls from hell.’ ‘Of course.’ ‘Well, why don’t you go there?’” (Flugel 1954 p.715).

The unsavory clergyman is deftly put into his place (hell, it would seem) much to the amusement of the reader. Individuals who themselves are observed to perform aggressive or disreputable acts can easily find themselves the butt of jokes.

“A passenger on the top of an omnibus lost his hat on a windy day at the seaside. The hat in its flight paused for a moment close to a man and woman walking on the promenade, but they made no attempt to retrieve it... The missing article having been eventually recovered, a further gust of wind blew away the woman’s hat and carried it into the sea” (Ghosh 1939, quoted in Flugel 1954 p.715).

Witnesses to the whole affair found the situation quite humorous, observing justice to have been served. Viewers only of the woman’s plight did not laugh, feeling only for the woman’s plight (Ghosh 1939, in Flugel 1954 p.715). Other, less complex examples of this can be found when any small misfortune befalls a notably pretentious or rude individual (Flugel 1954).

Additionally, aggressive humor can be utilized against entire other groups in much the same way. Direct ridicule of another group implies the superiority of the attacking group (Ziv 1984). Private group jokes share a similar purpose. This form of humor acts not only as a bonding mechanism for the group, but also as a defensive

measure, and superiority demonstration, as only the group members understand the joke. This inherently ostracizes others and indicates superiority over them (Ziv 1984). While creating a strong sense of fellowship within its participants, those left outside the circle of humor must deal with the aggression and perceived superiority of the group members (Lorenz 1963).

Humor involving the stupidity of some other group has long been a popular variation on this theme. Somewhat surprisingly, the groups disparaged in this manner are often quite similar and quite near geographically to the group instigating the ridicule. These ethnic jokes tend to be told about neighbors comprised of a subgroup of the local people living relatively close by. The targeted groups usually represent the most provincial of the society's own people as well as minority groups in various stages of assimilation (Davies 1988). Even in Israel, where one might expect a certain unique tolerance and understanding to be displayed, Jewish individuals from one community sometimes choose groups of Jews in other nearby communities to be the butts of their jokes (Ziv 1984). In this way, the centers of human communities mock the periphery, which they see as inferior, stupid, laughable versions of themselves (Davies 1988).

Figures of superior social status, rank, or power are often quite disliked, and thus are prime targets for aggressive humor. However, they represent a special challenge due to their innate power and ability to exact retribution on any inferior who might try to undermine their position. Due to the playfulness involved in humor, it is possible for inferior individuals to poke fun at those with more rank without fear of reprisal thanks to the shield provided by the concept of humor and the joke.

Hobbes disagreed with Plato and Aristotle, who claimed that mockery was the province only of the powerful. He instead argued that humor was an activity of the weak and inferior (Zillmann & Cantor 1976). More so, humor could be used as a tool against the superiority of those with greater status. As discussed above, humor is only fully appreciated when directed against a person or group who is disliked. Taking this one step farther, humor is further enhanced when it is employed against a disliked person, group, or institution which is not only disliked, but also to whom one is unable to express his true feelings freely due to that person, group, or institution's higher rank (Gruner 1978).

For example, children often resent the many rules and taboos thrust upon them by adults as they themselves begin to grow towards adulthood. Fed by this discomfit, children relish the opportunity to catch an adult in a mistake (Gruner 1978). Doing so allows them to feel better about themselves as they see the status of an adult, their "oppressor," slightly lowered. During World War II in Nazi Germany, it was quite dangerous to criticize Hitler. However, a veritable cornucopia of jokes flourished underground fed by the dislike for and oppression imposed by Nazi rule. As the war drew on, the poor conditions themselves became the objects of ridicule (Gruner 1978). More mundane, everyday targets include such officials as judges, doctors, clerks, clergymen, and government officials, as well as political parties and holy institutions, whose superior status and frequent generation of frustration for the common man have made them prime objects of ridicule (Ziv 1984). Humor's potential to aid coping will be discussed in greater detail in chapter III.

While a cutting slight may be an effective way to disparage someone, it is rather frowned upon, and is generally regarded as deplorable behavior. But, by cloaking the same insult inside of humor, it becomes socially acceptable and a usable means of criticism and social influence (Zillmann & Cantor 1976). Humor allows for aggressive feelings to be expressed, communicated, and acted upon without fear of repercussion. A good example of this concept can be seen in Aesop's fables, wherein uses of humor are disguised in symbolic form so as to prevent the book from being held responsible for embarrassing its readers (Kane, Suls, & Tedeschi 1977).

Essentially, so long as the aggressive tones are cloaked under humor, the statements are socially acceptable. Much of what is cloaked under the humor would otherwise be entirely inexpressible for fear of social norms and retribution and would have to be dealt with via other, perhaps less socially acceptable measures (Gruner 1978). In truly artful humor, it is possible to hide a slight so well that the attack hardly seems to register as such, allowing for the forbidden to be approached in a socially acceptable manner (Ziv 1984). As mentioned above, one of the most impressive and useful accomplishments whilst using humor is to deal a joke which the butt does not get.

Humor is exceptionally good at deflating and humiliating the great and powerful because it is the enemy of the ideal, of facades, and of pretenses. In positions of power and influence, individuals attempt to put on their best face and attempt to hide their flaws and shortcomings. Humor is able to sneak past these facades and bring to light their faults and defects (Boston 1974). It is a swift, brilliant illumination of the truth (Gregory 1924). Humor is a magnificent lie-detector and it is deftly able to tease out contrived

ideals and false enthusiasm. Indeed, the abrupt unmasking of pretense is particularly comical, allowing for observers to partake in the particularly sweet and indulgent laughter of truth revealed (Lorenz 1963). And just as the disposition of one towards the butt of humor affects how much one is bound to enjoy the joke, the degree to which one has been subordinated will influence the enjoyment of a superior's ridicule (Zillmann 1983).

Thus, this chapter has demonstrated that far beyond being a simple, playful amusement, humor has the ability to act as a highly aggressive and effective weapon of status and superiority. Neither individuals nor groups nor even those of higher rank are safe from its scathing glare. However, some rules do apply, as one's appreciation of humor will depend upon one's disposition regarding the individuals or groups involved. Nevertheless, this important facet of humor has featured heavily in both its historical study and evolutionary development.

### **III. Health, Catharsis, and Stress Relief**

“Laughter is the best medicine.” This down-home conception of humor predates even the far reaching theories regarding the aggressive uses of humor. Instances of this sentiment are referenced in the New Testament (Proverbs 17:22, New International Version). As early as 1790 the concept of the healthful properties of humor has been noted by academics such as Immanuel Kant (as discussed in Robinson 1983). But is there any credence to this claim? Does humor actually have a favorable effect on health? This chapter will investigate this assertion, claims to the contrary, the catharsis and stress relief properties of humor, and propose a theory as to how a perceived health effect may actually be the result of a change in perception caused by humor.

Many have proposed the link between humor and good health (Robinson 1983). In addition, stable mental health is thought to be concordant with the possession of a good sense of humor. Every human knows the sensation of euphoria which follows a bout of good laughter and which has the power to quickly whisk the party in question far from any negative feelings he or she might be suffering. Justification for the millions of dollars spent annually on comedic entertainment is derived in part from the belief in its therapeutic properties (McGhee 1979). This belief feeds a similar faith in the relation of humor to hope, the will to live, and love, and the ability of these notions to mobilize the human body’s defense mechanisms and to promote mental and physical health (Robinson 1983).

A startlingly dramatic, if entirely anecdotal piece of supporting evidence for the healing effects of humor, is the oft-cited account of Norman Cousins. In his book,

*Anatomy of an Illness*, Cousins describes how he recovered from a highly painful, supposedly incurable, degenerative collagen disease. Almost entirely crippled by the illness, Cousins conjectured that if negative emotions such as fear and hopelessness could have negative effects on the body, then perhaps positive emotions as caused by hope, love, and humor would have positive effects. Inspired by this, and a little further pharmaceutical speculation, Cousins placed himself on a strict regime of humorous movies and books and massive doses of intravenously introduced vitamin C. He found that with only about ten minutes of laughter, an analgesic effect sufficient to allow several hours of painless sleep was produced. This allowed him to reduce his use of pain medication and move out of the hospital. Over the course of several months, Cousins was able to return to work and made almost a complete recovery (Cousins 1979).

Yet, little other empirical evidence for the purported therapeutic value of humor exists. One recent experiment gave slight support to the claims of humor's health benefit. A 2005 study by Szabo *et al.* demonstrated that both humor and music were able to give comparable psychological benefits when compared to aerobic exercise (Szabo, Ainsworth, & Danks 2005). However, much more common are papers demonstrating mixed findings. A 2004 study by Kuiper *et al.* found that while coping humor, affiliate humor, and self-enhancing humor facilitated very low levels of depression, self-defeating humor resulted in higher levels of depression (Kuiper, Grimshaw, Leite, & Kirsh 2004). Considering the essence of self-defeating humor, this finding may not be particularly surprising. However, a 2005 study by Goodenough and Ford demonstrated that while coping humor, which was cited in the previous study as being quite beneficial, could help

to reduce pain in young patients with an adaptive problem-focused coping style, it actually showed an inverse effect in children with an emotion-focused pain coping style (Goodenough & Ford 2005). Considering the grand success of humor demonstrated by Cousins, these results seem rather paltry.

Further, these studies' supporting evidence dealt primarily with psychological and pain-related medical issues. What of more straightforward physical health issues? These results prove to be rather conflicted. A 2002 study by Boyle and Joss-Reid examined the relationship between humor and general physical and psychological health in 504 individuals and was based on data derived from an administered humor scale as well as a broad health survey. The results of this study found that individuals with a better sense of humor did not demonstrate higher levels of health (both physical and psychological.) Humor was utilized as a coping strategy to deal with pain or illness, but its use showed only a weak relationship to health in general (Boyle & Joss-Reid 2004). A paper by Svebak *et al.* (2004) examined humor, stress, bodily complaints, and life regard in high school students. Results demonstrated that stress level was the primary mediator of bodily complaints. Though not a primary causal factor, humor could mitigate the amount of bodily complaints evidenced by students, but only if the students held a high sense of importance in their lives. Students with a low sense of import showed a much lower relation between humor and bodily complaints. However, the general finding was that sense of humor was not directly associated with the level of physical complaints evidenced in the high school students (Svebak, Gøtestam, & Jensen 2004). Overall, there seems to be little evidence of humor acting as a benefactor to health.

There is, however, noteworthy evidence indicating that humor is often a detriment to health. A notable study by Kerkkänen *et al.* (2004) examined the relationship between health and humor in Finnish police officers over a period of three years. This study had surprising results, with humor not only failing to be related to good health but, more ominously, seeming in some cases to be associated with increased health risk factors such as smoking, overeating, alcohol consumption, increased body mass, and greater risk of cardiovascular disease (Kerkkänen, Kuiper, & Martin 2004). Another study by Friedman *et al.* (1993) examined data and subjects from the extremely long-running longitudinal study initiated by L.M. Terman in 1921. Childhood personality was found to be significantly related to an individual's long term survival. One finding appears uniquely distressing: cheerfulness (which was measured as a combination of ratings of optimism and sense of humor) was related inversely to longevity of life (Friedman, Tucker, Tomlinson-Keasey, Schwartz, Wingard, & Criqui 1993). Findings from a follow-up study undertaken by Martin *et al.* (2002) and examining the same data and subjects produced some evidence that cheerful (more optimistic and with greater senses of humor) children grew up to be more careless about their health, thus leading to their shortened life spans. However, this carelessness effect could not be directly related to their levels of smoking, tobacco, sex, or dangerous hobbies. The cheerful children were thus more likely to die in any given year, but not because of any particular external cause (Martin, Friedman, Tucker, Tomlinson-Keasey, Criqui, & Schwartz 2002). It seems then, that particularly with regard to physical health, having a sense of humor may be a significant detriment and seems to yield very little benefit.

From whence, then, has this idea of humor as a boon to health come?

Reexamination of Norman Cousins' recovery reveals an interesting theme. Perhaps the most significant component of his self-prescribed therapy was that he greatly reduced the amount of stress on his body. Upon reflection, Cousins noted that his illness seemed to set in after a particularly stressful few weeks of diplomatic negotiations in the USSR. In the hospital, he found himself stressed by frequent disturbances, ineffective and numerous blood draws, and powerful medications. Later studies would demonstrate that aspirin was stressful and particularly detrimental to patients with collagen diseases. By removing himself from the hospital, Cousins immediately eliminated a number of these stressors. Further, the analgesic effect of his humor regime (which was noted empirically in several of the studies previously discussed) allowed him to reduce the amount of powerful painkiller he was being administered, and also allowed him to go without the further stress-inducing aspirin (Cousins 1979).

The capacity for humor to reduce stress has been recognized by humor theorists for some time. The idea of a cathartic release of built-up emotional energy can be traced back at least as far as Aristotle's *Poetics*. Perhaps the earliest postulation of this property of humor is credited to Spencer in 1860 who asserted that the function of laughter is to serve as a means of releasing pent-up tension and energy (as discussed in Lefcourt & Martin 1986). This concept was borrowed by Freud who expanded upon it significantly, enumerating all of the different kinds of energy which could be transmogrified into laughter and speculating as to the process it entailed (as discussed in Lefcourt & Martin 1986). The heart of Freud's theory is the premise of an amount of psychic energy having

been raised for a now moot purpose which must be dissipated in some manner. This manner, he proposes, is laughter (as discussed in Morreall 1983).

Arousal theories such as Freud's postulate that a source of this pent-up energy might be found in frustration resulting from social taboos against desired activities, thus manifesting as Freud's vague nervous energy (as discussed in Morreall 1983). Humor seemed an apt candidate to relieve unconscious tensions such as aggressive, libidinal, or otherwise socially inappropriate impulses (Levine 1961). A simple example can be found in aggression and violence. In order to keep society in a functioning order, aggression can not be allowed to run rampant. Each culture has devised ritualized mechanisms of fulfilling aggressive needs. An example of this could be seen in competitive sports (Ziv 1984). Hostile or aggressive humor allows for a symbolic form of violence that could provide a suitable cathartic release of stored up aggressive energy (Singer 1968). If one individual dislikes another, society would frown upon him if he struck the disliked party. Instead, he might release this violent impulse by finding humor in a third party striking the disliked individual, seeing the disliked individual slipping and falling, or by making a hostile joke against the disliked individual (Morreall 1983).

Another major social taboo which is likely to result in a build-up of frustrated tension is that placed upon human sexual activity (Ziv 1984). Some sexual activities are restricted or forbidden in all human cultures. Sexual desires, the theories hold, are repressed to conform to the social norm, and so when someone cracks a sexual joke, sexual thoughts are called up and allow release and expression via laughter (Morreall 1983). As such, it is possible to see increased amounts of sexual humor in situations in

which acceptable sexual conduits are in short supply. Sexual humor functions to provide an alternate means of sexual satisfaction as well as to assist in dealing with the stress that the mention of sex is liable to cause (Ziv 1984).

Thus according to these arousal theories, any unfulfilled frustration or societal taboo can be sufficient to cause a build-up of emotional or psychic energy in need of dissipation. Any prohibited but desired action or desire can be a trigger for “relief laughter.” Nonetheless, Freud was really quite vague in his description of this pent up “emotional or psychic energy.” What is it? How can it be measured or even detected (Morreall 1983)? However, if one considers stress as an involuntary increase in tension and arousal, then the release of energy theorized to be afforded by humor and laughter according to the arousal theories could be seen to fit quite nicely with humor’s proven ability to mitigate stress (Lefcourt & Martin 1986).

In this vein, the phenomena of laughter and humor have been examined as a means of relief, often from uncomfortable or uncertain situations which cause stress to those involved. In almost every circumstance of laughter, it seems that some element of relief can be found, whether it be within the listener/observer, the relater of the incident, the teller of the joke (if there is one), or even with the butt of the joke himself (Gregory 1924). This ability of humor to reduce the degree of tension experienced by a group is one of its most important social functions (Ziv 1984). A theoretical example of how humor might have functioned in humanity’s far-distant past is offered by Konrad Lorenz (1963). Perhaps a primitive human hunting party, which has had to fiercely fight off a tiger not long before, hears a sudden rustling from a nearby cluster of dense shrubbery.

The group is terrified – what other fearsome predator could be lurking, about to pounce on the weary, injured party and induce another fierce battle to the death? When, instead of the expected deadly killer, an innocuous young fawn suddenly bounds forth through the leaves, the hunting party breathes a sigh of relief. The stress and anxiety of further potential combat dissipate and are replaced by a pleasant sense of relief and by a cheerful bout of laughter (Ziv 1984). The rapid transition from stress and danger to safety and security, as described in this theoretical situation, is a principle component of humor, and demonstrates the property of humor which lead to Spencer and Freud's observations about the cathartic properties of humor.

Another theoretical example could be conjectured in the meeting of two ancient humans. In ungoverned primitive situations, sighting and approaching an unidentified conspecific could easily be a source of significant stress. Is this individual an enemy or a friend? Are they intending to attack or welcome? When the conspecific turns out to be an enemy, the tension is justly warranted. However, when he turns out to be a friend, the surge of stress falls and is released into smiling, laughter, and humor (Gregory 1924). In agreement with the arousal theorists, humor allows for the body to release the stress reaction which had been called into being by the presumed presence of a stimulus that has in fact revealed itself to be either benign or nonexistent.

The relieving properties of humor are best triggered by a sudden reduction of stress after a drawn out period of tension or strain. This principle is exemplified in the appearance of the deer or the recognition of the friend in the prior examples and can also be recognized in the laughter emitted by children as they escape from the strict rules and

regulations of school (Gregory 1924) or the relieved laughter which accompanies a sudden recovery of one's balance after one has been in sudden danger of slipping and falling. In fact, this principle of humor is exploited by many jokes which build up some form of tension in their listener over the described situation, only to suddenly brush aside the induced stress with a pithy punch line (Morreall 1983).

Indeed, much empirical evidence has been accumulated which decisively demonstrates the ability of humor to reduce stress. This provides a possible explanation for the confusing results observed in the previously discussed studies. A paper examining a series of three studies was published in 1983 by Martin and Lefcourt. In the first study, subjects filling out a series of questionnaires produced support for the hypothesis that humor reduces stress and the negative impact of stressful events on mood. Subjects who scored highly on the sense of humor scale showed a weaker relation between depressed moods and negative life events than did subjects receiving lower on the sense of humor scale. In a second study, subjects' ability to produce humor was compared to the amount of stressful experiences they had experienced during the preceding year. Individuals who reported having high levels of stress during the past year were better able to produce humor. Further, individuals who were better able to produce humor when it was requested on demand showed a weaker relationship between stressful life events and disturbed moods. Finally, a third study correlated a self-reported rating of how often subjects would normally use humor in a stressful situation with observer ratings of the humorousness of their improvisational narration during a stressful film (depicting a primitive circumcision process). Results showed a correlation between

the subjects' self ratings and the degree of the funniness of their commentaries as well as to their scores on the Coping Humor Scale. This demonstrated support for the idea that those best able to produce humor in the lab were also more likely to do so in their everyday lives. Together these results provide compelling support for the premise that humor reduces the impact of stress (Martin & Lefcourt 1983).

Further studies have expanded upon these results. A 1993 study by Thorson and Powell found a correlation between lower death anxiety scores and use of coping humor (Thorson & Powell 1993). A 2002 study by Führ demonstrated that children express and increase in their use of coping humor after the age of 12 as the stresses of adolescence and the transition to adulthood begin to mount (Führ 2002). Another 2002 study performed this time by Abel showed that undergraduate students possessing a high sense of humor reported less stress and less anxiety than a low sense of humor group, even though both groups had experienced an equivalent number of stressful issues in the two months prior to the study. This evidenced that individuals with a better sense of humor not only were better able to deal with stress, but also felt less stress from situations in the first place (Abel 2002). Indeed, there is strong support for humor's ability to mitigate and relieve stress and anxiety under a number of conditions and in many circumstances.

Thus, humor might do more than simply help to relieve stress and its effects. It may in fact allow for humans to better deal with stress as it arises or even to reduce the effect of potential stressors in the first place. Humor may modify one's perception of a stimulus so as to render it less stressful and, indeed, perhaps even laughable (Lefcourt & Martin 1986). For example, during the two World Wars, propaganda, in the form of

posters, cartoons, and jokes, were used to make the enemy look a ridiculous and amusing figure of derision. This reduced the very serious and potentially mortal threat that the enemy posed to the patrons of this propaganda (Dixon 1973).

During frightening, dangerous, or otherwise stressful circumstances, humor can allow for a cognitive reappraisal of the situation. In illusion or reality humor can reduce the source of the stress, thus reducing the strain on the nervous system. This reduces draw on the individual's cognitive resources, thus freeing more energy to be focused on the creation of new stratagems and ways out of the stressful situation. In this way the humor response serves as a cognitive alternative to stress (Dixon 1973).

When forced to endure very difficult experiences or circumstances, humans often seek an escape through humor. Indeed, it is hard to be afraid, upset, or sad if one is in a playful, humorous mood. However, this is no easy task if one is faced with a formidable and serious situation (McGhee 1979). A hyperbolic example of this can be found in "gallows humor" (McGhee 1979, p.232). Humor has been noted among individuals about to be killed. Soldiers have been heard to laugh when an artillery shell has struck nearby, barely missing them. This laughter is made more shocking by the fact that in missing them, the explosion had in missing them, instead killed other of their fellow soldiers. During the bombing of London during World War II, an elderly woman ran dancing and shouting into the street after a bomb explosion narrowly missed her home – but utterly destroyed the house next door (McGhee 1979). Often times, this ever-present element of distress at the grimness of the situation is recognized in "black humor," with

the humor often only being communicated and acknowledged with a smile rather than a full belly laugh or dancing and shouting (Ziv 1984).

However it may be demonstrated, the use of “gallows humor” allows the individual to raise some shield against that which seeks to disturb and frighten (or even kill) him. It can help to impart to the involved party a sense of mastery as an active form of coping (Ziv 1984). If a colleague or leader is able to make light of a dangerous and stressful situation, his “laughing in the face of death” demonstrates his lack of fear, and communicates to those around him that the situation may not be so fearful nor as dire as it seems. If used aggressively, humor can be turned on the stressor and greatly reduce (in reality or merely in appearance) its ability to impact and harm the individuals involved (Dixon 1973).

In its capacity to reduce stress, humor carries with it one very important trait – a pronounced denial or alteration of the reality of the situation. The seriousness of the situation is often ignored, any threat of harm, injury, or death is forgotten, and an air that all is normal is often present (Flugel 1954). The burden of stress which the situation carried moments before is laid down and forgotten (Robinson 1983). This is a critical realization as it serves to explain much of the data presented with regard to the mechanism of humor’s stress reducing properties. Humor does not simply improve health, or even simply relieve stress. Instead, it reduces the threat posed by the stressor itself and raises the individual’s appraisal of their own health, thus resulting in the misleading beliefs about the health benefits of humor. In dire situations, humor makes the situation seem less serious or threatening to the individual or group involved.

Evidence of this process of humor is demonstrated by two recent articles. Both Kuiper and Nicholl (2004) and Martin (2004) found evidence that despite no difference in observed health or health habits, individuals with greater senses of humor reported more positive perceptions of their own health, less fear of death, less fear of disease less preoccupation with negative bodily concerns, and less anxiety regarding pain. Individuals with a greater sense of humor imagined themselves to be healthier and held less fear of negative health possibilities, despite the fact that they were not objectively healthier in any way. Perhaps this illusion may sometimes cause such a disregard for serious situations or the health of the individual that they may over apply humor and as a result fail to avoid situations and experiences which do pose a significant threat to them. This lack of seriousness could result in a failure to recognize the dangers of smoking or excessive drinking, the benefits of exercise or other healthy practices, or the risk involved in certain hobbies or occupations. This fact might serve to explain the decreased longevity observed in humorous and cheerful individuals. Thus, humor creates a lack of concern for the gravity of serious and stressful situations and can alter human perception of the outside world and human behavior with significant consequences.

Though this chapter seems to end on a minor point, this realization it is of vital import, as it highlights the principle means of humor's stress alleviating properties. Humor does not improve health. Humor does not release stress from a human being like some sort of valve. Instead, it allows humans to reimagine their situations into something less threatening, less cognitively and physically taxing, and more conducive to their own

intellectual operation. Thus, humor allows mankind to apply illusion to reality and deflate its severity so as to improve his own experience and to aid in his own survival.

#### **IV. Sexual Selection, Creativity, and Humor**

In the preceding chapters, three fundamental components of humor - incongruity, superiority, and relief - were examined. In addition, the origins of laughter, the import of play, and humor's alleged ability to improve health were considered. In the final chapter before the elucidation of this paper's unified theory, a seemingly tangential aspect of humor is considered. In this chapter, creativity's role in humor is explored and the role of sexual selection in the development of creativity and humor is proposed.

Before the core of this chapter can be pursued, the background evolutionary processes must first be described. In addition to the process of natural selection described by Darwin, the other major influence on the process of evolution is that of sexual selection. This concept was developed and vastly expanded upon by Fisher (1958), Zahavi (1975), and Trivers (1976). Beyond getting over the hurdle of simple survival, sexually reproducing organisms must also deal with the added challenge of finding and successfully reproducing with a viable and evolutionarily fit mate. Sexual selection operates in two modes: intrasexual and intersexual selection. Intrasexual selection entails the propagation of traits which aid in the establishment of dominance or direct competition against same-sex conspecifics for mating opportunities. Of more interest to this paper is the concept of intersexual selection. This form of sexual selection involves the preferential choice of certain traits by one sex with regard to the other. Unequal contribution to reproduction leads the sex inclined to sacrifice greater resources during the process (often the female, due to factors such as the greater size of her gamete and the energetically costly gestation period) to become choosy in its selection of with

whom to mate. However, if both sexes are making a significant resource contribution, choice can be exerted by both parties, as is the case in humans (Buss 1988). Preferred characteristics can be selected for a variety of reasons. The presence of the choice trait may indicate that a particular organism is free from parasites or disease, and is thus able to produce the particular trait. A given trait could indicate that the individual has generally better genes, allowing them to produce the particular phenotype and indicating a better overall ability to survive and reproduce (Alcock 2001).

A variant of this mechanism is embodied in Zahavi's (1975) handicap hypothesis. This hypothesis theorizes that traits which seem to be disadvantageous and, indeed, appear to act as a hindrance to the survival of an organism might be selected for precisely because they are disadvantageous and encumbering. By bearing a costly trait, the individual transmits a signal to potential mates that demonstrates its high quality. Not all individuals are capable of producing the trait, due to its prohibitive energetic and fitness costs. In order to counter the trait's substantial cost to produce, the individual must be very healthy and possess very good genes. The larger or more complex the hindering trait, the more fit this particular organism is. This makes it impossible for a trait to be displayed falsely by a genetically unqualified individual and thus constitutes an honest signal. The classic example of a trait of this type is the large, demonstrative, and obstructive peacock tail (Zahavi 1975). Characteristics may also be preferred simply because potential mates happen to be attracted to a certain behavior or phenotypic construct. This type of preference, known as runaway selection, can result in quite eclectic phenotypes as the trait or behavior need not have any other actual evolutionary

purpose. In this type of preference, the genes resulting in the initial preference are handed down to the next generation, causing one sex to display the trait, and the other sex to carry a stronger predispositional preference for the trait (Alcock 2001). In any case, the traits actually serve the same function as the traits selected for by intrasexual selection – that is, mate attraction. They still serve to distinguish the individual organisms from their conspecifics, but do so in a less direct manner than by directly affecting dominance hierarchies or providing advantages in combat (Buss 1988).

A series of studies by Buss (1988) demonstrated that sexual selection has acted to influence human preferences. In his studies, he produced evidence that males more frequently utilized tactics which advertised their possession of and ability to provide resources in their attempts to attract mates. Meanwhile, he found that females tended to utilize tactics which altered their appearance and made them appear more physically attractive to males. However, his studies also demonstrated that one of the most utilized tactics by both genders was that of demonstrating possession of a good sense of humor (Buss 1988).

Over the past several years, one researcher has argued for the theory that sexual selection has resulted in a human preference for a number of cultural and psychological phenomena. In a 1999 paper, Miller proposes that most creative cultural displays have been sexually selected for, acting as indicators of the phenotypic and underlying genetic quality of the individual producing the display. The most common and dramatic human cultural expressions such as music, artistic endeavors, ideology, word-play, and humor seem utterly wasteful and maladaptive when considered from a natural selection

perspective. However, when viewed from the perspective of sexual selection, these creative displays seem to be precisely the type of behavior which would be produced by intersexual selection. Human cultural practices require energy and time and yet provide no evident survival benefits. They are unique to humans. Their significance is drawn from the perceptual and cognitive impact they have on others. Their production requires the possession and application of intelligence, creativity, and health. They demonstrate significant individual differences in that they are 1) self-expressive and 2) highly varied in individual ability to perform them (Miller 1999).

The fact that human ability to produce creative, culturally valuable displays varies so widely is particularly interesting with regard to sexual selection. A sexually selected signal often allows for genetically well-endowed individuals to emphasize the perception of differences between themselves and other conspecifics. Thus, the vast variability seen in human cultural ability seems to lend considerable weight to this argument. The intelligence, creativity, and requisite health needed to perform impressive cultural displays are advertised through the displays themselves. These displays are honest signals because they require not only natural talent, but a great investment of time and other resources from the individual. Further, the basic foundations of cultural displays are significantly ritualized, allowing for easy detection of the potential corruption of the signal due to inferior display attempts, while the high levels allow for wide variability and considerable invention. Also, even the simple fact that the human mind is capable of recognizing, appreciating, and admiring another's cultural display provides evidence

pointing to the likelihood that selective mate choice lent a hand in generating the very phenomenon being esteemed (Miller 1999).

In addition, Miller provides a number of statistics regarding the proportion of creative works produced by men and women respectively. His results show that men have produced about 20 times the number of jazz albums as women, eight times as many modern paintings, and three times as many books in the English language. These statistics indicate that cultural displays seem to have been sexually selected for in men by women. This is perhaps in line with the concept that although both human sexes evidence some mate choice, female choice plays a stronger role, perhaps in selection overall, and at least as evidenced by selection for intelligence and creativity (Miller 1999). However, these statistics are only correlations and, though significant, could also be explained by other cultural factors such as the long history of women's oppression and lack of opportunity for them to become involved in these often exclusive creative endeavors.

In 2000, Miller published another article specifically illuminating sexual selection's contribution to the evolution of human music (Miller 2000a). Also in 2000, Miller argued that many traits of the human psychological construct were influenced by sexual selection to act as fitness indicators, with a particular emphasis on the advertisement of intelligence, as codified by the "g factor" (Miller 2000b). The next year, Miller followed this with a paper detailing the sexual selection process with regard to the capacity for human artwork (Miller 2001). An intriguing article published in 2000, by Kanazawa applied Miller's sexual selection arguments regarding intelligence,

creativity, and culture to the production of scientific discoveries. This article demonstrated that not only was the distribution of discoveries over the lifetime of married male scientists equivalent to that of musicians, artists, and writers as shown by Miller (increasing after puberty, maximizing in mid-adulthood and declining throughout the remainder of adulthood and the remaining lifespan) but that nearly a quarter of the scientific discoveries were made within 5 years of being married. This pattern only held for married male scientists. This finding seemed to indicate that after marrying, scientists cease producing their valuable and costly cultural displays (scientific discoveries), while unmarried or female scientists were unaffected and continued to make scientific discoveries throughout their lives (Kanazawa 2000).

A series of recent studies by Griskevicius, Cialdini, and Kenrick (2006) examined the effect that romantic motives could have on the generation of creativity. The basic hypothesis of their first study was that if creative cultural displays had evolved in part as a courtship mechanism, than providing cues related to mating, as opposed to neutral cues, might result in more creative displays. Participants were presented with attractive photos of individuals of the opposite sex and asked to imagine going on a first date with the individual from this lineup that they felt was the most desirable romantic partner. Creativity was assessed via analysis of short stories written about simple pictures, cartoons, the idea of a perfect first date with their chosen individual, and their concept of pleasant weather. The first two stories were written before the romantic partner stimulus, while the last two stories were written after this prompt. Comparison of the stories before and after the relationship prompt demonstrated that only males wrote more creative

stories after being charged with the romantic cue. As a result of the evidence of significantly greater male creative cultural displays from the Miller and Kanazawa papers, it does not seem surprising that an increased creativity rate might only be found in males. The other studies described in this paper went on to demonstrate that creativity was not affected by degree of effort, mood, arousal, or monetary incentives. Further, creativity increases were only observed in women when participants were presented with primes relating to the attraction of mates for long-term relationships (Griskevicius, Cialdini, & Kenrick 2006).

The evidence presented thus far has focused primarily on the signal being sent. However, this signal is useless if it is not being received and causing results. The studies examined above have shown that men seem to produce creative cultural displays as a result of sexual selection. But are women paying attention? This is crucial not only as proof of sexual selection being the cause but also in order for the desired effect to be elicited as a result of the displays – increased mating opportunities. Numerous studies have demonstrated that what women are attracted to in a man (such as scent or measure of masculine facial features) varies with her degree of fertility as dictated by her menstrual cycle (Gangestad & Thornhill 1998; Johnston *et al.* 2001; Penton-Voak & Perrett 2000; Penton-Voak *et al.* 1999; Rikowski & Grammer 1999; Thornhill & Gangestad 1999b; Thornhill *et al.* 2003). A recent study by Gangestad *et al.* has demonstrated that female preferences also change for male behavioral displays. In this study, women responded to video tapes of men classified (unknownst to the participants) by the behavioral type they displayed. Women in the most fertile period of

their menstrual cycle most preferred the concept of a short term relationship with male videos classified as high in “Social Presence” and “Direct Intrasexual Competitiveness.” This differential attraction did not appear with regard to short-term relationships at any other time during their menstrual cycle, nor did it appear at any time with regard to long-term relationships. These results, in agreement with past research, indicate that women are predisposed to be interested in extra-pair copulations with men exhibiting signals related to good genes. This result is particularly relevant as this study deals only with behavioral phenotypes rather than physical traits (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen 2004).

More specifically, a recent study by Haselton & Miller has provided evidence that creativity has been sexually selected for. In their study, results indicated that the degree of a woman’s fertility as mediated by her menstrual cycle increased the attractiveness of creative intelligence with regard to short-term relationships. Women who were in the most fertile period of their menstrual cycle found vignettes describing poor but creative men to be more attractive than rich but uncreative men for short-term (though not long-term) relationships. This fits with the theory raised in prior female cycle research that women would experience increased attraction to (and possibly seek extra-pair copulations with as a result) men with better genes, but who were not as good providers. Thus, this study provides significant evidence that creativity evolved as either a beneficial adaptation itself or as a mechanism to signal good genes (Haselton & Miller 2006). Further, the results of this study, as well as those of the numerous other papers discussed, provide significant evidence for the sexual selection of cultural displays advertising

intelligence, creativity, and health in men and that these displays are observed by and influence women.

While the evolutionary benefits of intelligence and health seem relatively apparent, why might creativity be sexually selected for? Aside from the possibility that its preference was a product of runaway selection, why else might creativity be useful? Several articles provide an answer. First, a 2000 article demonstrated that creative cultural displays such as music ability may be an honest signal of male fitness. This study found that the lower their ratio of second to fourth digit length in male musicians in a British symphony orchestra the higher their rank within the orchestra. Low 2D:4D ratios are indicative of relatively high adult testosterone concentrations and higher numbers of sperm per ejaculation. This indicates that the musicians' creative musical ability may, in fact, be an honest signal of their evolutionary fitness (Sluming & Manning 2000).

Another answer is provided by Miller, who published a 1997 paper regarding the Protean Strategy in primate competition and courtship. Its main premise was that with the evolution of "Machiavellian intelligence," essentially the ability to predict and/or manipulate the behavior of one's conspecifics, it would have been increasingly difficult for primates to compete against their fellows without a means of defeating their ability to predict and manipulate them. The defense to this threat is essentially to adopt as random and unpredictable a strategy of behavior as possible. The Protean Strategy can be observed in the pursuit-avoidance tactics utilized by many prey animals as they attempt to escape predators. However, Miller's paper draws attention to the application of this

principle to psychological mechanisms as well. Specifically, sexual selection of this principle in psychology could lead to human creative intelligence via variable creative solutions to interpersonal and both intrasexual and intersexual situations (Miller 1997). Indeed, perhaps one of these creative solutions has been the use of creativity in the production of humor.

Koestler's "bisociation" from chapter I demonstrates the critical link which exists between humor and creativity (Koestler 1964). One of the fundamental components of humor is the realization and resolution of an incongruity. These incongruities reveal new ways of looking at a word, statement, or situation, and often create new meaning via the introduction of a less-than-obvious, tangential, or unlikely element. The illumination of incongruity requires creativity to drive the process of bisociation. Humor is dependent upon incongruity, incongruity upon bisociation, and bisociation upon creativity. Therefore, humor is dependent upon creativity. Even the simplest forms of humor require some small, even unconscious flash of creativity in a human observer in order for humor to exist. A businessman may slip on a banana peel by himself, but it is the human observer who creates humor in this simple accident by realizing and appreciating the incongruous disparity between this staunch individual's expected behavior and his observed ridiculous performance, as well as the loss of esteem he suffers. Thus, the possession of creativity in an individual will be a prerequisite for humor production. Further, if a claim were to be made that humor itself had been sexually selected for, it would be a necessary prerequisite for creativity to be selected for as well.

The evidence presented in this chapter has shown that creativity is a sexually selected trait. This, thus, prepares the way for the supposition that humor itself may be a sexually selected trait. Miller himself considered humor as one of the cultural displays which may have been sexually selected for (Miller 1999). Many studies have shown that humor is consistently rated as one of the most desirable traits that a potential mate could possess. This finding has been replicated in many studies. These include Hewitt (1958), Hansen (1977), and Todosijevic, Ljubinković, and Arančić (2003). Of particular interest in studies of this type was a 2002 paper by Sprecher and Regan. This paper not only examined preferences in mates (spouses or dating partners), but preferences in casual sex partners and friends as well (both opposite-sex and same-sex.) This paper showed, as the others did, that for both sexes a sense of humor was one of the most desired traits not only for romantic partners, but across all relationship types as well. Further, higher levels of preferred traits (including humor) were desired from potential partners depending on the level of sexuality involved in the relationship. Humor was found to be equally important in spouses, dating partners, and casual sex partners. Higher levels of humor were desired when selecting these partners than in selection of either opposite-sex or same-sex friends. However, individuals also desired higher levels of desired traits (including humor) from their opposite-sex friends as compared to their same-sex friends. The important difference between a friend of the opposite-sex and one of the same-sex is that the possibility of copulation exists with the former, while it does not with the latter. The presence of this unconscious bias in relationship preferences provides support for the idea that humor has been sexually selected for (Sprecher & Regan 2002).

Two very recent papers have provided further and more specific support of this proposition. In a 2006 paper by Bressler and Balshine, participants were asked to rate paired photos (of equivalent attractiveness) and autobiographies of individuals for desirability as a potential romantic relationship partner. Experimental manipulation was applied to the degree of humor exhibited in the presented autobiographies. The results of the study showed that only women viewing men chose the humorous individual as more desirable with statistical significance (Bressler & Balshinem 2006). This is precisely the type of result which would be observed if humor were a trait sexually selected in males by females. However, how does one explain that fact that both genders were shown to find sense of humor attractive in the previously mentioned studies? This idea that sense of humor is appreciated differently by the two sexes is explored in another study in 2006 by Bressler *et al.* This study asked participants to rate the importance of potential partners' humor production versus their humor receptivity (i.e. willingness to laugh at the participant's jokes). Further, participants were asked to indicate whether they preferred an individual who only produced humor or one who only appreciated the humor the participant produced. The results of the study showed that though both men and women valued a good sense of humor in their potential relationship partners, women placed value in the potential partner's ability to produce humor, while men placed value in their potential partner's ability to appreciate (and laugh at) the humor that they produced (Bressler, Martin & Balshine 2006). This finding gives further validity to the concept that humor evolved as a result of sexual selection, as it specifically highlights a female preference for the production of humor, as well as a male response to the female's

response to his humor. These studies thus provide significant evidence in support of the proposition that humor evolved as a result of sexual selection.

This chapter examined the evolutionary principle of sexual selection and explored the possibility that creative cultural displays could have arisen as a result of this principle in action. Further, it drew a link between creativity and humor and explored the idea that humor might also have been sexually selected for. The sexual selection of humor will be further discussed, and a specific mechanism proposed, in the next and final chapter of this paper.

## **V. A Unified Theory of Humor and Its Evolution**

The preceding chapters of this paper have traced a line from humor's simplest origins in play signals and basic incongruities, through humor's enhancement by and application to aggressiveness and stress reduction, and finally to the essential element of creativity and its implications for sexual selection. Much research and effort has been invested by many researchers studying humor with regard to each of these topics. In addition, some of the basic overlaps found among these areas, such as how humorous disparagement of a disliked party can also lead to stress reduction, have also been explored. However, no study or theory has attempted to examine all of these facets of humor together. This final chapter will do just that. It will also go one step further by examining all these facets together through an evolutionary lens to produce a unified theory of humor and its evolution.

As has been discussed above, one prerequisite needed for humor to exist is the presence of a playful environment. However, the existence of a playful environment requires the development of play. As discussed in chapter I, play is a nearly universal trait among mammals. The extended lifespans of mammals (relative to many other life forms) provide an environment in which play is both a benefit and a necessity. Indeed, many have argued that play is, in and of itself, adaptive. The longer lives enjoyed by mammals allow time for play early during the life cycle during which the animals are able to learn, practice, and refine skills which will be needed later in life.

Common skills refined through play are those of hunting, fighting, and myriad sociosexual and locomotive skills. Examples of this can be seen in the tussling of

puppies, the chase behaviors of primates, and the youthful wrestling of young humans. Also, as discussed in chapter I, it is quite important during play episodes for the play fights to remain harmless, and not be misinterpreted and develop into real fights. Herein lays the importance of play signals. These signals indicate to the participants that the activity they are initiating or involved in is not to be taken seriously and most certainly should not be interpreted as a threat. These signals often consist of both visual and auditory forms, thus providing information as to whether the communicating individual is engaged in a play mode or maintaining neutrality. In primates, play signals can include a teeth-baring grimace used to indicate appeasement and which is startlingly similar to a smile, as well as a chuckling vocalization which bears striking similarity to laughter (Darwin 1955). It is quite likely that these behaviors are the evolutionary precursors of humans' modern play signals of smiling and laughter.

The primary context of these play signals is one of incongruity. That is, the play signal itself is one that is used to signal a basic incongruity – “I am being attacked, and yet I am not being attacked.” This contradictory dynamic is exemplified in children's laughter-filled tickle fights. Chimpanzees, closely related to humans by a comparatively recent common ancestor, demonstrate laughter when being tickled, as a means of encouraging the tickler to continue an activity which could be easily misinterpreted as a threat. The laughter acts as a play sign to indicate that it is safe to continue this activity, and that the ticklee acknowledges the atmosphere of play which surrounds the event (Matusaka 2004). The tickle fight demonstrates an ideal form of mock fighting as the activity is generally enjoyable, and yet the tickling of vulnerable areas is also unpleasant

enough to elicit an appropriate defensive response. Meanwhile, the pleasurable play signals (laughter and smiling) keep the mock battle's ferocity in check. The pleasure involved in play is an obvious requirement, as its evolution would encourage individuals to continue the educational and ultimately adaptive interaction.

This seemingly simple interaction provides one of the most important steps in the evolution of true human humor. When the play signals of laughter and smiling were developing, these signals would not have been directly linked to the pleasurable feelings. However, as the positive reinforcement for play fighting came to be elicited at the same time and by the same stimuli as the play signal, the positive reinforcement and the mock battle play situation became linked. This would prove to be a critical step in the evolution of humor, as it meant that the incongruity inherent in pretend combat or pursuit could eventually come to be coupled with the enjoyable feelings selected for in order to sustain and prolong the play interaction. In sexually matured adults, this is similar to the pleasure associated with sex – the pleasure encourages the act's important biological effects. This critical step in play explains why incongruity has the power to elicit pleasurable feelings in modern humans and further, as this link developed within the play situation, it provides a logical explanation for why humor can only occur within some form of playful circumstance.

At this point, one must make an important note. While play is a trait shared by all mammals, humor is not. For example, though it can be shown that rats emit particular vocalizations akin to laughter when tickled and during rough and tumble play, and that rats find these interactions rewarding and seek them out, this does not mean that rats

possess humor (Burgdorf & Panksepp 2001). This merely demonstrates that the underpinning link of play behavior and play situations to pleasure exists in all mammals. This link alone is not sufficient to constitute humor. The incongruity of the play situation requires intelligence and creativity to be recognized, acknowledged, and to spark humor.

The extra spark of increased cognitive intelligence began to evolve in higher mammals – the primates. It is this additional factor which would allow for incongruity to begin to be applied to create humor. As discussed by Koestler, man's creative process is fueled by "bisociation," the bringing together of two separate factors to create something new (Koestler 1964 p.36). It is only through the application of observation and thought that any incongruity can be appreciated humorously. As discussed in chapter IV, even the simplest forms of humor require the application of intelligence and creativity in order for humor to exist. A businessman may slip on a banana peel, but in order for the incongruity and humor of this event to be appreciated, an observer possessed of a certain level of cognitive ability is required. This level would most likely include at least 1<sup>st</sup> and 2<sup>nd</sup> order intentionality as well as the rudiments of a theory of mind. These important foundations of cognition are required before real humor can be produced. Thus, the fundamentals of humor should only begin to be observed in higher primates of greater intelligence, such as hominids.

There is sparse evidence, and mostly anecdotal, which indicates that at least gorillas and chimpanzees may be capable of producing some simple forms of incongruity humor. Only limited research has been done in this area and very few examples of simian humor exist. Indeed, the vast majority of this anecdotal evidence is drawn from

the famous enculturated gorilla, Koko, with a few examples also being taken from the enculturated chimpanzee, Washoe. These particular apes are well known for having been the subjects of extended studies examining the language learning potential of non-human primates. Carefully instructed by dedicated researchers, these apes have achieved some degree of proficiency in communication via sign language. However, the precise degree to which these apes have actually acquired language ability is still hotly debated.

The examples of apes' basic humor fall into several categories. The first is the use of objects for jobs other than which they are intended or play with imaginary objects. Washoe was once observed to pick up a toothbrush, call it (by signing) a hairbrush and then use it as such, despite the fact that she had never been observed to use any object aside from a hairbrush in this manner (Fouts 1977 as cited in McGhee 1979). Koko is frequently observed to pretend to eat without actually consuming any food or to pretend to eat inedible objects (Patterson 1977 as cited in McGhee 1979). Second, a common pastime in many signing apes is the purposeful misidentification of items. This behavior is usually prefaced with play signs or a bout of refusing to cooperate with their handler (McGhee 1979). Despite consistently correctly identifying a certain object when not asked to name it, when a response is specifically requested of her, she will often refuse to answer or will purposefully and incongruously mislabel the object. Koko also enjoys playing a game in which she will consistently do or sign anything but what is asked of her (Patterson 1977 as cited in McGhee 1979). Third, language capable apes will also purposefully change part of a well learnt sign. A good example of this can be seen in an interaction in which Koko was refusing to give the sign for bottle, a sign she knew well

and had mastered long ago. When she finally relented, she made the sign with perfect accuracy, but instead of making it to her mouth as normal she made it to her ear. This was distinctly incongruous, and was decidedly more than simply shoddy signing, as all other parts of the sign except its location were extremely well executed (McGhee 1979).

Thus, these types of stories, while anecdotal, seem to indicate purposeful production of incongruous situations on the part of apes, such as would be expected if apes had evolved the ability to recognize and appreciate incongruity and had also begun to develop the desire to produce it. However, what these species lack is the true evolved ability to produce these incongruities effectively. It is important to note that these reports are only found in enculturated apes that have been taught some form of human or artificial symbolic language. Though wild chimpanzees and gorillas do engage in play behavior, such as tickling and chasing, and evidence basic visual and auditory play signals, no instances of actual humor production have been observed in wild ape populations (Gamble 2001). Thus, this evidence seems to support the proposition that at least apes, and perhaps other species of primate as well, possess the basic cognitive abilities needed to recognize, appreciate, and even desire incongruity. However, without language they were unable to produce or utilize it effectively without the help of human-taught language skills.

In the review above, a key point emerges. Species of apes and presumably extinct hominids do seem to have the basic tools needed to produce very basic humor, usually involving simple incongruities. However, their ability to produce and communicate these observations is hindered by the simple physical limitations of what incongruities can

physically be demonstrated without language. Language seems essential to the effective production of humor. This makes sense as language makes it much easier to communicate one's ideas to others as well as providing as many objects as there are words with which to construct incongruities. Thus, full fledged humor would not be expected to arise until some form of language evolved. However, as mentioned in chapter II, the exact timing of the emergence of language is a hotly debated and complex subject beyond the scope of this paper. A simple cladogram depicting the approximate points of the appearance of these traits can be found in Appendix A: Figure 1.

These observations suggest at what points in the evolutionary past certain prerequisites for humor would have arisen. This thus allows for the state of humor's evolution to be conjectured as well. But beyond being a relic of play behavior, why would humor have been preserved as a trait which has now become a human universal (Wilson 2004) and why are factors other than incongruity, such as disparagement and stress reduction, also related to humor? Consider the following scenario:

A group of prelinguistic australopithecines (anatomical reconstructions suggest that these creatures did not have the capacity to produce speech) is traveling in a group through the jungle (Stanford, Allen, & Antón 2006). Suddenly, one individual hears a noise or glimpses a flash of movement – a predator! This individual, hereafter referred to as individual A, emits an alarm call, warning his conspecifics to react to the threat. Warning calls are common in primates, as well as in many other mammalian species. The other members of the group, along with A, react by preparing to fight, hiding, and attempting to escape. The group is put on alert, preparing for battle or flight. Their

sympathetic nervous systems are activated, and their stress levels increase. This state of readiness is costly and, along with the increased levels of activity and preparedness, A's conspecifics also begin to draw on their resources of time, energy, and cognitive attention at a significantly higher than average rate.

This reaction is entirely appropriate if individual A's warning is accurate. If a tiger is prowling just a few yards away from the group, then the increased resource costs are a bargain compared to the likely injuries or deaths that the group would sustain if the dangerous predator were able to strike without warning. However, what if A's warning is false? In this case, his mistake would be causing his group to be wasting valuable resources. This would put unnecessary strain on the group, wasting resources, and resulting in reduced fitness for all of the group's members. Indeed, if most of the group members would be genetically related to individual A, his mistake is causing many copies of his genes to suffer reduced opportunities to survive and multiply. A's seemingly simple mistake would, in fact, result in rapidly compounding damage to both his own and his extended genetic lineage's evolutionary fitness.

Further, if individual A's warning were real, the group would be appropriately strained by its reaction and the ensuing fight or avoidance of the threatening predator. However, once the confrontation ended, the group would be able to quickly return to a neutral state. This is not the case if individual A's warning is false. Once the false alarm call is made, how long does the group wait before it can determine that there is actually no threat? For the duration of this extended false alarm reaction, the group would be forced to endure unnecessary stress, waste valuable energetic reserves, and spend time

which could be used for any number of useful activities. In addition, how does the group eventually come to stand down from this stressful alert state, and return to a homeostatic condition? Any further time spent in the alert state after the falseness of the alarm or the departure of the threat can be confirmed will result in still greater waste of time and resources.

Perhaps the answer lies in humor. Recall chapter III's elucidation of humor's noted ability to reduce the effect of stress by allowing its source to be taken less seriously. One of the principle components of humor, incongruity, is inherent in a false alarm call. Individual A warns that the group is being attacked – and yet the group is not being attacked. This incongruity could allow for the spark of humor to ignite. All that is needed is some fuel to begin the blaze - the requisite element of play. Without an acknowledgement that a given incongruity is something non-threatening (something playful), then the incongruity in question will only become more disruptive and stressful. If another of this particular species, individual B, were to point out the existence of the incongruity in a playful, non-threatening manner (which will be vastly aided by the fact that he is also announcing that there is no danger), humor could be produced. Humor could be found in what was previously a frightening and stressful situation. Indeed, the joke could be born.

This now playfully depicted incongruity is observed and acknowledged throughout the group. Incongruity, the same stimulus which once aroused pleasure during play episodes will result in the activation of these same reward pathways. The relaxation and pleasure released by these reward pathways will counteract the stress

summoned by the alarm call and allow the parasympathetic nervous system to replace the influences of the sympathetic, thus returning the group to a state of rest and ending the purposeless waste of valuable resources. What was only moments before a very stressful situation could now be seen to be nothing more than a humorous foolish mistake.

Indeed, this foolishness on the part of individual A leads to another important application and modern component of humor, that of superiority and disparagement (discussed in chapter II). Indeed, if individual A frequently makes false alarm calls, and the group continues to pay attention to him, his inept actions will be detrimental to both the group's and his own survival. This is particularly true if he suffers no repercussion from his mistaken alarms and his opinion and authority remain respected by the group. One way in which the negative effect of false alarm calls could be greatly reduced is if the group noted who had made the bogus call and decreased their respect for, and particularly, the degree to which they paid attention to him and his alarm calls and decisions in the future. The prevalence in modern humans of this "boy-who-cried-wolf" principle is exemplified by the existence and popularity of the folktale of the same name.

But how is individual A's responsibility for the call brought to the group's attention? Perhaps when individual B realizes that there is, in truth, no predator and points out the incongruity in the form of a primitive joke, he makes that joke about individual A. In doing so, B would not only notify the group of the false alarm and remove their stressor, but by using humor to disparage A, he would also be notifying them of individual A's responsibility for the false alarm and would reduce the groups regard for A, helping to ensure that in the future individual A's alarm calls would come

under closer scrutiny. In addition, as is observed in the use of disparaging humor, it most often serves not just to reduce another's status, but also to increase the status of the joker, often by exemplifying his wit and intelligence at the expense of his victim's. In the case of the hypothetical group of human ancestors, disparagement would prove quite useful, as it would cause them to increase individual B's status and to pay more attention to him in the future. This would be appropriate and useful to the group, as B demonstrated a better and more valuable awareness of his surroundings and superior observational skills by determining that there was actually no threat present. By producing effective humor, an individual could reap the rewards in the form of increased access to important resources, such as food and potential mates, thus creating a fitness difference between himself and others. This would create a selection pressure for humor ability to persist and to evolve into its modern form.

To be able to say precisely where along the evolutionary path a form of humor incorporating the core principles observed in modern humor is difficult to determine. For the purposes of the present theory the loosely defined "species between the ape-hominid split and the advent of language" has been used. While the basics of the proposed interaction would theoretically have been possible prior to the evolution of language, the arrival of language development would have been reflected in the vastly broadened degree to which humor could be applied and utilized. This principle can be observed even in apes such as Koko and Washoe, in that though they possess only rudimentary humor abilities on their own, when they are taught sign language, their capacity for humor is greatly increased. Thus, the basics of humor were laid in most mammals with

their extended lifespans and play. Further, developments as outlined here would likely have occurred in a more derived and encephalized, yet still nonlinguistic primate, while true humor in its modern form would not be achieved until language arrived, vastly broadening the applications and potential for humor to be used.

Indeed, the emergence of language emphasizes one final critical portion of humor's evolution – that of creativity. While creativity would still have been applied in the prelinguistic stages of humor, the advent of language would truly allow this facet of humor application to flourish. Consider again the example scenario involving individuals A and B, but now let individuals A and B have the capacity to speak. Also, imagine one other group member, individual C. Suppose that both B and C noticed that individual A's alarm call had been false and each made a joke at A's expense. However, C's joke is much more creative, bringing together more disparate aspects of the present incongruity and taking a more scathing swipe at A than B's joke. By taking the very same situation and making a better and more creative joke than B, C is able to not only better reduce the group's stress, but also to cause a greater decrease in unreliable A's status, while gaining for himself a greater increase in status. This granted status is again better for the other group members as well, as they will benefit from better respecting an individual who is better able to correctly assess and communicate potential dangers from the world around them. Further, as the greater status gained by C as a result of his superior creative and humor abilities will also give him better access to group resources, creativity and humor could be expected to be traits desired by potential mates, thus resulting in sexual selection

for both creativity and humor. A number of articles demonstrating that very phenomenon were presented in chapter IV.

A brief point should be made here with regard to the gender of humor. As discussed in chapter IV, women tend to value the production of humor by their mate while men tend to value the appreciation of humor by their mate. It seems most likely that this is the case due to the fact that in these ancient human groups, the male individuals would have been the more apt fighters, and thus would have been the ones most likely to be keeping watch for and responding to threats. They thus also would have been more likely to detect the absence of a threat, and thus best suited to benefit from the status effects that would come from humor production. This is not to say that female individuals did not produce humor. However, the sex roles in ancient humans at the time of humor's evolution would have made male humor production more likely, and would also explain the observable modern bias towards male humor production, as well as help explain the sexual selection for humor and creativity in human males found in the studies discussed in chapter IV. Humor would have been preserved in females as well, though, for two reasons. First, in order for the beneficial humor traits to be selected for, the females doing the selecting would have to have the ability to appreciate and enjoy humor. Second, as the females are selectively mating with the humorous males, the genes for humor are going to be carried by these couples' female offspring as well as their male children. Thus, sexual selection also allows for the existence of both female humor appreciation and production. This is similar to Fischer's model of runaway sexual selection (Fisher 1958).

To conclude, this chapter has demonstrated a simple means by which incongruity humor could arise from basic play situations. Further, this chapter has traced a potential path for the evolution of humor, and lastly, has proposed a possible evolutionary scenario by which humor could evolve into its modern form. The theory described in this chapter is illustrated in Appendix A: Figure 2.

## Conclusion

The foundations of humor can be traced to the play behavior which comes with the extended juvenile period characteristic of mammals. This play behavior allows for important life skills to be safely practiced in preparation for adulthood. To practice these often aggressive behaviors without fear that play will be misinterpreted as an actual threat, visual and auditory play signals arose from appeasement gestures in the form of smiling and laughter. These signals became coupled with the concept of incongruity inherent in the play environment (one which seemed to indicate a threat, when in fact no threat was present) as well as with the pleasure that arose to reinforce the repetition of the play fighting. As primates began to increase in intelligence, a species somewhere between the ape-hominid split and the development of language began to utilize humor for more diverse applications. In situations of a false alarm call, humor could be used to effectively remove the stress of the group, thus reducing the group's waste of resources. With the evolution of language it became even easier to apply humor, allowing for the disparagement of the false alarm call for the good of the group and to the benefit of the joker, as well as allowing the joker to make more creative and effective jokes. This became a valuable skill, causing creativity and humor to become sexually selected traits and ensuring that humor would become the monolithic evolutionary and cultural force that it is today.

One final point must be mentioned here. While the scenario described above is supported with much evidence from the available data of humor research, it suffers from the same flaw which plagues almost all evolutionary psychology theories – it is almost

impossible to prove that this series of events is what really happened. This paper proposes an evolutionary scenario which deftly combines and explains the prerequisites, major facets, and applications of humor and makes a strong argument that this story could have been the way in which humor evolved. However, while this very well could be the real story of humor's evolution, there could perhaps be another story which could explain it just as well. Thus, while the proposed theory cannot be directly tested, the theory can be supported by tangential lines of study and can, at the very least, provide a springboard for further research and thought on the subject.

Such research could delve further into the cognitive ability of chimpanzees and gorillas, as well as those of other lower apes, to determine what level of humor they are actually capable of producing and appreciating. Bonobos could be investigated. Studies of apes in the wild might be more focused on observing the precursors of humor. Modern human hunter gatherer cultures could be observed to see if their hunting parties used humor in the manner described in the scenario. New evidence as to the exact time of language's evolution would be a great help in determining when exactly humor arose.

Indeed, there are many further directions in which humor research can be taken. While the theory described above may be difficult or impossible to prove in its own right, perhaps it may act as a starting point for new theories to delve deeper into the mysteries of humor. Let this possible path of the evolution of modern humor provide a guide for applying evolutionary thought to other significant human phenomena, a demonstration of how quite separate theories and approaches might be combined into a meaningful whole,

and a starting point for future explorations of the complex, frustrating, and spectacular creature that is man.

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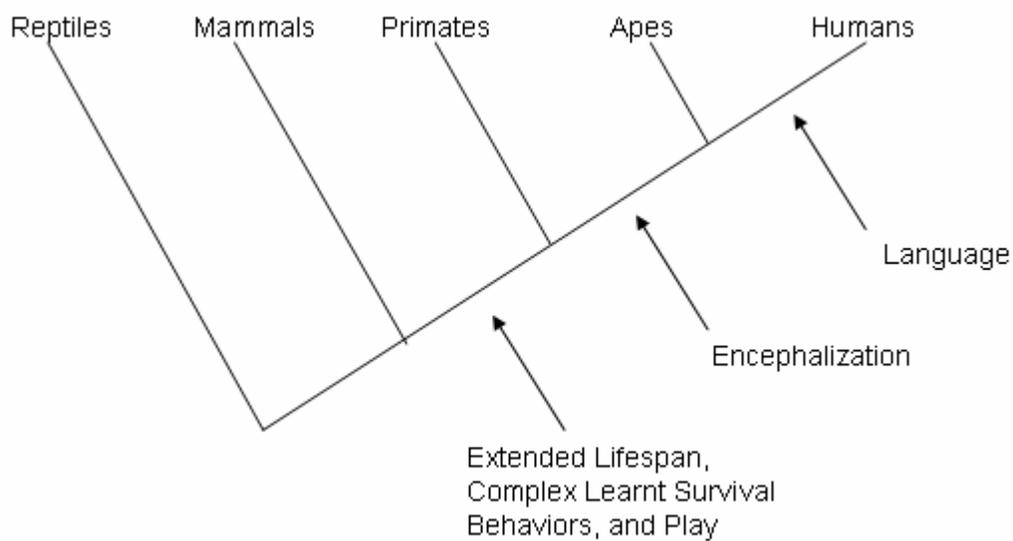
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**Appendix A: Figures**

*Figure 1.* A simple cladogram with approximate appearance points of important traits.

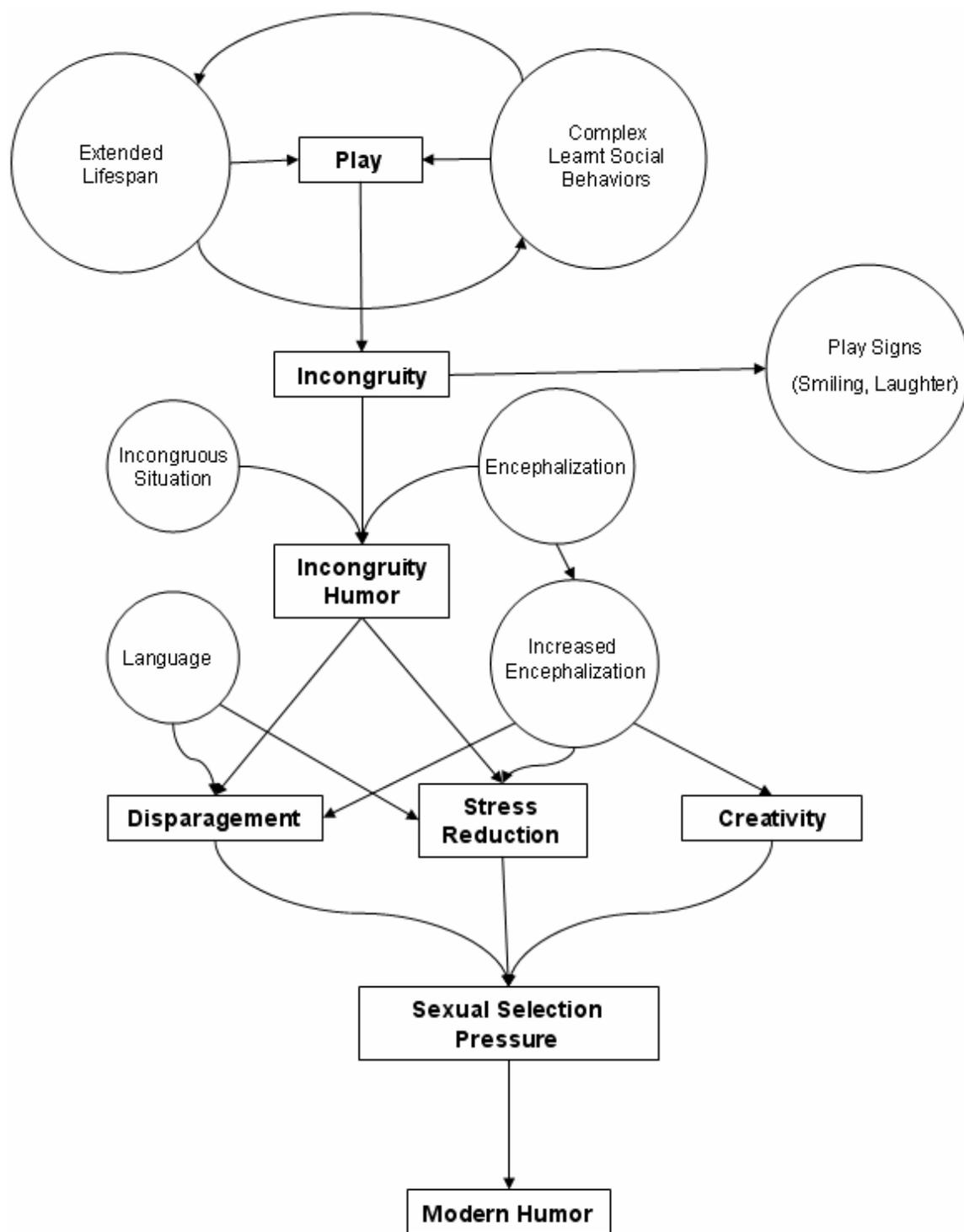


Figure 2. A visual summary of this thesis' unified theory of the evolution of humor.

## Appendix B: Jokes

Due to the anecdotal quality of jokes, formal citation has not been applied to the introductory joke and this appendix. Instead, a brief description of origin is provided.

- Two muffins are sitting in the oven together. One muffin turns to the other and says, “It’s getting a bit warm in here, don’t you think?” The other muffin yells, “Aaaahh!! A talking muffin!” (Courtesy of Julia Fogerite)
- Each day at precisely 6 o’clock, a doctor would stop at the local pub for an evening drink. Each day he ordered the same thing – an almond daiquiri. But one day, Dick, the bartender, realized at quarter to 6 that he was out of almonds. Instead he substituted hickory and made the drink. The doctor came in, ordered, and Dick gave him his drink. The doctor tasted the drink and spat out, “This isn’t an almond daiquiri, Dick!” “No, it’s a hickory daiquiri Doc!” (Adapted from *A Prairie Home Companion* with Garrison Keillor )
- A man walks into a bar with a giraffe and says to the bartender, “A beer for me and one for my giraffe.” The bartender slides them each a beer. The pair gulp down bottle after bottle until finally the giraffe passes out and falls to the floor. The man gets up, pays his tab, and goes to leave. The bartender yells to him, “Hey! You can’t leave that lyin’ here!” The man replies, “That’s not a lion! That’s a giraffe!” (Adapted from *A Prairie Home Companion* with Garrison Keillor )
- Darth Vader said to Luke Skywalker, “Luke, I know what you’re getting for Christmas.” “How could you know that?” “I felt your presents.” (Adapted from *A Prairie Home Companion* with Garrison Keillor )
- “Waka, Waka, Waka this way!” (Fozzie Bear sign pointing the way to the *Muppetvision 3D* attraction at Walt Disney’s MGM Resort)
- Serendipity is searching for a needle in a haystack, and finding the farmer’s daughter. (Serendipity, as defined by Professor Sir Hans Kornberg)