The Science of Fiction

Evolutionary Explanations of Hypothetical Human Behavior  
Volume 2

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“Lois is a Dead Woman!: The Parent-Offspring Conflict that is Lois and Stewie Griffin” © Janet Guan
“Resilience and Human Development” © by Alex Levy
“Why Can’t Anybody Find Michael Scott Somebody to Love?” © Lauren Irwin
“Imaginary Friends With Developmental Agendas” © Marro K. Park
“Cars Have Feelings Too: Lightning McQueen and Peer Effects” © Michael Starr
“Memento: A Reflection on Memory and Memory Loss” © Kimberly Vanni
“Machiavellian Intelligence Linking Species Together” © Lauren Malone
“To Dream an Endless Dream” © Ping Heh
“Procrastination: The College Student’s Eternal Bedfellow” © Jake Greenberg
“Laughter and Humor from a Scientific Perspective” © Melissa Aldecoa
“A Prisoner’s Dilemma: Decision making on the individual and group level” © Patrick F. Chew
“Why, Peter, Why?!” © Jessica Pray
“Pulp Non-Fiction: The Science of Forgiveness in Altruistic Relationships” © Josh Canter
“Attraction” © Ben Powell
“Nature versus Nurture: Effects on Sexual Orientation” © Lee Rubinoff
“Darwin and Juliet: A Scientific Exploration of the Search for the Perfect Mate” © Rachel Clark-Spear
“Why Multiple Relationships?” © Vanessa Martin “Captain John H. Miller as a Model of Pro-Social Behavior” © Josh Neale
“Eric Cartman as a Model for Behavioral Game Theory” © Ben Kagel
“Scapegoat or Murder Simulator: A Study on Violent Video Games and how they Influence Aggression” © Evan Friscia
“Heroism Across Three Warrior Cultures in Comparison to the
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U.S.” © Frank Herrera
“Sociopaths and Serial Killers: On how people become capable of committing selfish acts of violence without remorse” © Keith Dore
“Dr. Hannibal ‘The Cannibal’ Lecter and Serial Killers: Does abuse beget violence?” © Kenneth Carbajal

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Preface

This edited volume is the second emanating from my course, *The Origins of Virtue*. The papers in this book sit at the crossroads of art and science. Applying a Darwinian reading to works of fiction, they attempt to reveal aspects of the human condition. These writings span a wide range of academic disciplines, including evolutionary biology, cognitive neuroscience, social and developmental psychology, economics, and anthropology. What binds them is a shared commitment to understanding behavior from an evolutionary perspective. Following Niko Tinbergen, legendary ethologist, these essays attempt four kinds of explanations: at the proximate level, we are after the mechanisms underlying a behavior; at the ontogenetic level, we ask how a behavior gets to be the way it is over the course of development; at the functional level, we learn why natural selection favored a particular behavior; and, finally, at the phylogenetic level, we study the distribution of behaviors across a range of species. The fictional works brought under the microscope include a comic strip (*Calvin and Hobbes*); television series (*Family Guy* and *The Office*); movies (*Memento, Cars, Forgetting Sarah Marshall, Pulp Fiction, Saving Private Ryan, Silence of the Lambs*, and *The Dark Knight*); and even Roald Dahl’s *BFG*.

In part one, “Developmental and Environmental Effects,” we learn why babies sometimes kill their mothers; what it takes to thrive in a hostile world; how early experiences shape adult personalities; why children sometimes have imaginary friends; and, how our peers shape who we end up becoming.

In part two, “The Mind and the Brain,” we learn how memory works and how it sometimes breaks down; why living in social groups is associated with the ability to manipulate others; and, why we dream.

In part three, “Emotions and Decision Making,” we discover why we always seem to wait until tomorrow to do what can (and probably should) be done today; why we laugh; how we resolve moral dilemmas and how groups sometimes resolve them for us; why we feel guilty for doing wrong; and, why we sometimes forgive others for having done us wrong.
In part four, “Love and Sex,” we learn why we feel the attractions we do; whether sexual orientation is best explained by genetic or environmental influences; how we go about finding the perfect mate; and, why, when it comes to women, men just want more.

Finally, in part five, “Good and Evil,” we discover what makes some people heroic; what makes others selfish; whether playing violent video games unleashes violent behavior; whether there are common threads in heroism across cultures; and, why some people become sociopathic serial killers.

The quality of these articles resulted from the combination of the students’ efforts and excellent instruction. In the fall and winter quarters the students were immersed in the deepest of scientific questions—How did the Universe begin? How did Life evolve? How will the Universe end? They entered my class ready to think like scientists thanks to the professors, Tony Friscia, James Larkin, Bill Moore, and Blaire Van Valkenburgh, and the other teaching fellows, Adam Lawrence, Ryan Ellingson, Laura Griffin, and Jessica Walker. As the instructor, I’d also like to thank the UCLA Freshman Cluster program for making a course like this possible and providing me with incalculable assistance. In particular, thanks to Greg Kendrick and Susan Griffin.

The most important acknowledgment, of course, goes to my students, the writers of this tome: Alex Levy, Ben Kagel, Ben Powell, Evan Friscia, Frank Herrera, Jake Greenberg, Janet Guan, Jessica Pray, Josh Canter, Josh Neale, Keith Dore, Kenneth Carbajal, Kimberly Vanni, Lauren Irwin, Lauren Malone, Lee Rubinoff, Marro Park, Melissa Aldecoa, Michael Starr, Patrick Chew, Ping Heh, Rachel Clark-Speare, and Vanessa Marin. Thanks for making this quarter so fun and so rewarding. Any insights you, the reader, may glean from this book reflect their intellects and efforts; any errors in reasoning or fact reflect my teaching!

Karthik Panchanathan
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Part I

Developmental and Environmental Effects
“Lois is a Dead Woman!":
The Parent-Offspring Conflict that is Lois and Stewie Griffin

JANET GUAN

“Stewie, Peter and Lois aren’t taking you with them.”

“No! No, you can’t leave! Not without me! I’m the baby! Oh, I haven’t been this disappointed since I saw ‘The Lake House’.”

And so begins the 100th episode of “Family Guy” in which baby Stewie finally succeeds in killing his mother Lois and achieving world domination. The conflict between mother and infant—and Stewie’s homicidal tendencies—however, has existed before his birth. Even before his head gained its odd football shape, Stewie displayed clear antagonism against his mother, scheming new plots to destroy her while still in the womb.

Indeed, parent-offspring conflict has been erroneously reduced to a psychological, sex-related explanation. Freudian psychoanalysts would describe Stewie’s behavior as a variation of the Oedipus complex coupled with his homosexuality, that he sexually yearns for his father and so competes with his mother for Peter’s affection. But homosexuality is in itself a whole other can of worms. Regardless, the Oedipus complex was nonetheless fully adopted by psychoanalysts to explain a male infant’s desire to monopolize his mother’s affection and nurturance. An infant’s hostility towards his father is then spurred by his jealousy and fear of castration by the hands of his father. The infant ultimately wants to kill his father to sleep with his mother. Eventually, the infant resolves the Oedipus complex by simply relinquishing his sexual interest in his mother and identifying with his father (Daly and Wilson, 1990).
The sex-linked Oedipus complex, however, limits parent-offspring conflict to behavior, gender-based antagonism, and the temporary time period of infancy and toddlerhood. Instead, parent-offspring can begin as early as conception and continue long after the offspring’s birth: chemical conflicts between a mother and fetus inside the mother’s womb can have later repercussions in the offspring’s behavior toward his parent. Consequently, Stewie’s malicious “death drive” towards Lois cannot only be explained by his consciously wanting sex with his father, but rather, as an evolutionary outcome of a conflict of interest between parent and child. That is, parent-offspring conflict is not solely centered on psychology and the sexual interests of the infant for the opposite-sex parent, but is founded on the inheritance of genes and the process of natural selection itself.

“Stewie, uh, how long you been all messed up and evil like this?”

Maternal-fetal conflict, one kind of parent-offspring conflict, arises from a disagreement over the duration and amount of parental investment. Mother and fetus essentially clash over whose inclusive fitness, or the fitness of an organism measured in relation to the survival and reproductive success of its kin, is maximized. Natural selection has favored the mother to maximize the reproductive success of herself and all her offspring but has favored the fetus to maximize his own quality and survival. As a result, the opposing genetic and individual interests of the fetus and mother collide; what is good for the fetus then is not necessarily good for the mother. It is better for the fetus—but costly to the mother—if a mother transfers more resources to the fetus during pregnancy. Whereas an individual fetus has been selected to maximize his own particular survival by taking more resources from his mother, a mother has been selected to maximize the total number of surviving offspring by resisting some of the fetus’ demands and equalizing the allocation of resources to all offspring. Whereas a current fetus is completely related to himself and only partially related to his future siblings (less so if a mother has offspring by different males), a mother is related to all her offspring equally. The fetus is ultimately competing with his siblings for available resources; this sibling rivalry subsequently takes the form of conflict between mother and fetus (Trivers, 1974).

There is conflict over the duration, as well as the amount, of parental investment between mother and fetus. To ensure its survival, a fetus will attempt to prolong the parental investment it receives even though natural selection on his mother will have favored cessation to maintain a sufficient amount of
resources for future offspring, e.g. nursing and feeding. When the cost to a mother is two times greater than the benefit to the offspring (cost and benefit measured in terms of reproductive success), a conflict ensues over the continuation of parental care and the maximization of the mother or offspring’s reproductive success. A mother has been selected to nurse and invest in all potential offspring equally, but a single offspring is rather selfish, placing the individual gains of nursing above all others’ and devaluing the cost of nursing to his siblings and even to his mother. Additional investment in one offspring decreases the mother’s ability to produce and invest in future offspring, measured by a heightened risk of maternal death during the period of parental investment, a reduction of parental resources, or a decrease in later investment below what would have originally been given to a future offspring. The duration and intensity of this nursing and weaning conflict ultimately depend on one offspring’s expected degree of relatedness to potential siblings. If there a low degree of relatedness, as in a polyandrous society in which women have children by different men rather than a single male, the duration and intensity of the weaning conflict increase (Trivers, 1974).

Although intimate, the relationship between mother and fetus is rarely, if at all, harmonious. The conflict between the two, however, is not one between organisms, but between genes. It is natural selection on the genes that creates the disagreement between mother and fetus over the length and amount of parental investment in a current and future offspring and also enhances a conflict between the maternally-derived and paternally-derived genes within fetal cells (Haig, 1993). In genomic imprinting, the expression of genes depends on whether it is inherited through the mother’s egg or the father’s sperm. Paternally-derived genes, which are active only if inherited from the father, tend to increase fetal growth. In contrast, maternally-derived genes, which are active only if inherited from the mother, tend to reduce fetal growth (Rogers, 2009). The conflict between the two within fetal cells wholly represents the larger-scale conflict between the mother and fetus themselves. The paternally-derived genes within fetal cells generally value the mother’s other offspring less so than do the maternally-derived genes of the same fetus: paternally-derived genes want the current fetus to receive more than the allotted amount of maternal investment whereas maternally-derived genes favor the reproductive success of the current offspring just as much as future offspring, and therefore attempts to cap the quality-oriented bias of the paternally-derived genes. (Moore and Reik, 1996).
"Lois is a Dead Woman!" Janet Guan

“I can’t do it. You’re a terrible, evil child, but you’re still my baby, and I could never hurt you.”

Natural selection—and the cost/benefit ratio of reproductive success—plays a role in the maintenance of pregnancy just as it does in maternal-fetal conflict. Maternal genes will favor an “adaptive miscarriage” if the embryo nutritionally stresses the mother or if the embryo is of “low quality” and the mother would gain more by investing in existing of future offspring of “higher quality.” Adaptive miscarriages usually occur in early pregnancy, before the 12th week, to minimize costs and to prevent the loss of otherwise valuable resources and time (Haig, 1993).

But despite this profound conflict within the fetal cells and between the mother and fetus, maternal and fetal immune mechanisms exist to prevent females from rejecting their genetically dissimilar fetus and to ensure a successful pregnancy (Hunt et al., 2006). Without these adaptive defenses, a female’s immune system would automatically recognize the embryo as a foreign body and act to fight and abort it. Similarly, certain medication suppresses the immune systems of organ transplant patients, preventing them from rejecting the different, foreign, donated organ that is not their own.

The HLA-G gene is the “medication” for pregnant women, coding for the production of uterine and placental molecules and proteins that maintain the pregnant uterus as an immune privileged site. The symbiotic immunological relationship between mother and fetus inhibits more powerful signals from overriding the normal protective systems, e.g. antibodies produced by the fetus that would allow detachment from the endometrium, or the mucous membrane lining the uterus. The HLA-G gene contributes to uterine and placental immune privilege by driving certain cells into immune suppressive modes; maternal cells that were once “natural killers” are now tolerant of the foreign DNA and RNA (Hunt et al., 2006). Fetal cells also employ certain defenses to avoid detection that would incur maternal immune responses directed against them. That is, genes expressed in fetuses are selected to actively maintain their pregnancy, e.g. secreting a plethora of progesterone, the primary female hormone responsible for the nutritional maintenance of embryo development and the pregnancy itself (Gerlinskaya and Evsikov, 2001).
“Lois is a Dead Woman!”

“You drove me here, Lois, with all the indignities I’ve been forced to suffer day in and day out under your matriarchal tyranny.”

Maternal-fetal conflict itself may indeed be responsible for the success of a pregnancy and thus purposely selected for by natural selection. Haig argues that this conflict equates communication between the fetus and mother, providing information about and moderating the needs and resources available to both. This genetic “tug-of-war” fundamentally facilitates a successful pregnancy, a benefit to both mother and fetus.

After a female’s egg is fertilized by a male’s sperm, the embryo attaches to the endometrium, or mucous membrane lining, or the uterus. At this point, the arterioles to the endometrium begin to lengthen and coil to form spiral arteries, vessels that later supply maternal blood to the placenta, while endometrial glands secrete carbohydrates and proteins to nourish the early, small embryo (because the circulation of maternal blood to the placenta is not yet fully established). Moreover, the paternal genome generally contributes to placental growth more than the maternal genome since paternally-derived genes favor the fitness of the current fetus rather than that of future, possibly unrelated, offspring. That is not to say that the mother will continuously attempt to deprive or abort the embryo. In fact, the mother’s daily food intake plays a significant role in fetal growth and nutrition. She now consumes a larger amount of fat to not only meet the new costs of pregnancy but also to prepare for the later trimesters of her pregnancy and the following period of lactation (Haig, 1993).

But because evolution has selected for maternal-fetal conflict to ensure a successful birth, the fetus will attempt to enhance his own survival and well-being by maximizing his own inclusive fitness. The mother will then respond accordingly. While the fetus tries to increase his blood supply, increase his blood sugar, and maintain the supply of progesterone, the mother works to contest these actions. After implantation, fetal cells invade the walls of the spiral arteries and destroy the maternal nerves that cause them to constrict to open up blood supply. Similarly, fetal cells release placental hormones into the mother’s blood that affect her physiology to his benefit. Thus, fetal cells and hormones divert the mother’s blood to itself by reducing the flow through her other tissues, taking over the mother’s control of blood supply to the placenta. However, the mother can enable several defense mechanisms to restrict fetal invasion and reduce the damage inflicted by the fetus to her maternal tissues. The mother can indirectly remedy the situation by opening arteries in the rest of her body (thereby decreasing the pressure in the spi-
ral arteries) or by lowering her overall blood pressure in the first and second trimesters of pregnancy. The lengthened and curled shape of the spiral arteries, another maternal adaptation, also helps reduce blood supply to the fetus (Rogers, 2009).

Although increased maternal blood pressure can greatly benefit the fetus, it can have dire consequences for the mother and eventually, the offspring. Hypertension combined with an excessive amount of protein in maternal urine (known as proteinuria) results in preeclampsia, a major cause of maternal and fetal mortality. Otherwise, a hypertensive pregnancy without proteinuria can actually reduce the likelihood of fetal mortality and morbidity compared to non-hypertensive, normotensive pregnancies (Haig, 1993). That is, the constant feedback in the form of a contentious conflict between mother and fetus is necessary for a favorable pregnancy, as epitomized by the advantages of a non-proteinuria, hypertensive pregnancy. Natural selection has thus favored for maternal-fetal conflict to allow communication between a mother and her offspring to establish a relationship of moderation: the fetus informs his mother, sometimes forcibly and detrimentally, of his needs and his mother responds according to her available resources and adaptations, sometimes imposing a ceiling on how much she supplies her current offspring to maintain her reproductive success as well as that of all her offspring (Haig, 1993).

Furthermore, mother and fetus compete over how much blood sugar each receives after a meal. While a fetus works to maintain high blood glucose levels, the mother is selected to normalize them with insulin. After a non-pregnant, non-diabetic human consumes a carbohydrate-filled meal, his blood sugar level temporarily increases but then stabilizes with insulin, a hormone produced by the pancreas that regulates the metabolism of glucose and other nutrients. After a woman in her second to third trimester of pregnancy consumes a meal, however, her blood glucose and insulin levels remain high for a longer period of time. The difference is the presence of a fetus, which secretes human placental lactogen into the mother’s blood (Rogers, 2009). The placental hormone works independent of maternal control and blocks the effects of insulin, keeping the blood sugar level high for a longer duration after meals and thus increasing the supply of nutrients to the fetus. Additionally, because the placenta contains enzymes that decay insulin, the mother responds by increasing insulin production (i.e. she “notices” that her initial batch of insulin did not reduce blood glucose to a stable level and so produces more insulin to remedy the failures of the first batch). The longer time period between peak blood glucose and normalization with insulin allows the fetus to take a greater share of the blood sugar, removing more glucose from maternal blood than is in maternal interests (Haig, 1993).

If the fetus wins this round of “blood-glucose-tug-of-war,” then both he and
his mother suffer. If the mother cannot make enough insulin to reduce the blood sugar level, she can develop glucose intolerance and gestational diabetes which could perhaps lead to diabetes after pregnancy. But the nutrient content of maternal blood is ultimately determined by a balance between fetal manipulation (human placental lactogen) and maternal counter-measures (increased insulin production); both mother and fetus must then bear the costs of conflict of interest over blood glucose to receive its mutual benefits (Haig, 1993).

As aforementioned, fetal cells also secrete progesterone to maintain the pregnancy even after the mother has stopped producing the hormone (Gerlinskaya and Evsikov, 2001). If the secretion of progesterone stops, the pregnancy ends. During the eighth week of pregnancy, the mother cuts off her supply of progesterone, but the placenta, at this point, makes the hormone itself and secretes it into the mother’s blood, thus continuing the pregnancy and the fetus’ existence. Progesterone is not only responsible for the nutritional sustenance of embryo development, but also for the response of the maternal immune system to embryonic antigens. That is, progesterone, like the HLA-G gene, contributes to the “immunosuppressive environment” of the placenta, preventing the mother’s normal immune cells from rejecting the foreign body that is the fetus (Hunt et al., 2006). Additionally, as with the fight over blood glucose, the fetus has some adaptations to gain advantage in the fight over progesterone and certainly, the pregnancy itself. Fetal hormones can manipulate maternal receptors, but maternal hormones can not manipulate placental receptors; it is a one-way operation that gives the lead to the fetus. Because maternal circulation does not control the hormonal communication between fetal cells, the physiology of the placenta is not directly regulated by maternal signals. As a result, the placenta can produce sufficient amounts of progesterone to sustain the fetus after the eighth week even though the supply of maternal progesterone has been discontinued (Haig, 1993).

Moreover, the presence of a fetus can induce nausea and vomiting. Studies show that a woman is less likely to miscarry if she experiences some nausea, with or without vomiting, in her first trimester of pregnancy. Bouts of “morning sickness” are in fact attempts by the fetus to discharge certain toxins ingested by the mother, avoid miscarriage and maintain the pregnancy. That is, a placental factor—indeed, something favored by natural selection—is responsible for maternal nausea (Haig, 1993).
“I suppose I’m not ready to kill Lois or take over the world ... yet.”

Even after the fetus is born, conflict still persists between parent and offspring. Although fetal genes have lost their ability to directly and biochemically influence the mother’s physiology (and as of now has no physical authority over his mother), the infant himself still has behavioral and psychological methods to better its reproductive success and overall fitness at costs to its parent(s). Trivers argues that the conflict is now limited to behavior founded, yet again, on a disagreement between the duration and amount of parental investment. For example, parents and offspring fight over the child’s bed time because the latter has been selected to take greater parental investment than the former has been selected to give. The offspring wants to prolong his bed time as much as possible whereas the parents want it as soon as possible to prevent behavior problems the next day that could take a toll on many of the parents’ resources (e.g. time, energy, etc.). This struggle over when parental investment should end and how much should ultimately be invested also takes the form of nursing and weaning conflict, as aforementioned. To get what he wants, the infant will also exploit his parents’ psychology, displaying certain emotions to elicit a certain response from his parents, e.g. crying because he’s hungry or smiling because he’s satisfied with a particular parental response. But because the offspring can manipulate this communication system to his advantage, selection has, in response, favored the parents to discriminate the uses of signals as they gain more experience as parental figures. With time—and with more children—parents learn not to give in to their offsprings’ manipulation as easily. The genetic conflict between mother and fetus within the womb then manifests into a behavioral and psychological tug-of-war outside the mother once the offspring is born (Trivers, 1974).

The fetus, as evidenced, is neither a passive player in this conflict between mother and offspring nor is he purposely choosing to harm his mother and potential siblings to enhance his own reproductive success. He, unlike Stewie, is not motivated by diabolical, homicidal intentions, but by evolutionary drives that place his own fitness ahead of his mother and sibling’s. He, like Stewie, is a hotbed of conflict because natural selection, not the Oedipus complex, has made it so. These fights over blood pressure, blood glucose, and progesterone and maternal-fetal conflict in general are not “failures of adaptation” but rather successes of placentation; indeed, a fetus’ healthy survival and birth because of this conflict are testament to the profound role of evolution on a genetic level (Haig, 1993).

But perhaps this evolutionary explanation for maternal-fetal conflict exists just to piss off Freudian psychoanalysts. Trivers and Haig could have presented all
this biological evidence for the conflict only to have it turn out to be a “simulation” of knowledge, in which it inconclusively “ended like ‘The Sopranos’, where it just cut to black in midsent.”

Janet Guan is currently a first-year History and Asian American Studies student at UCLA. And although she enjoys the slapstick comedies of Seth MacFarlene, her first and foremost love is “The Simpsons” (the classic episodes, not that political and social commentary, temporarily relevant, modern stuff). While not watching her animated comedies, Janet is figuring out how to change the world one 10-page paper at a time.

References


Resilience and Human Development

ALEX LEVY

Most children that grew up in the 1990’s probably spent some Saturday mornings watching the Mighty Morphin Power Rangers. Zordon, the wise sage, selects five teenagers with ‘attitude’ to defend against the evil witch Rita Repulsa. These teenagers are given special powers which allow them to fight evil. The power to morph into a Power Ranger is not enough to defeat the evil figures sent by Rita who is bent on world domination. The constant mentoring and the friendship formed by these five teenagers allow them to overcome whatever dangers they face. As the television seasons progress, Rita kidnaps a lost teenager and turns him into a Green Ranger for purposes of destroying the original five Power Rangers. After a mighty battle the Green Ranger is defeated. Through friendship and mentoring the Green Ranger is convinced to change and becomes a Power Ranger to fight evil and preserve peace on earth. Although the program gives no background on these teenagers others than they had ‘attitude,’ it must be assumed they had protective factors in place which allowed them to develop into caring teenagers, willing to follow the code of not revealing their identity and only using their powers for good. They developed strong friendships with each other and had a mentor, Zordon that supported and guided them as they developed skills and became resilient to evil.

Why did the Power Rangers continue to fight when it looked like all was lost and there was no way out? What causes some individuals to prevail, no matter their background or the problems life throws them always landing on their feet? Why do people succumb to the stresses of life and develop maladaptive behaviors such as dropping out of school, becoming drug addicts
Resilience and Human Development

Alex Levy

and criminals or others who incur behavioral and mental health issues? The answer is resilience.

Resilience can be defined as a dynamic process. An individual would be considered resilient if after exposure to significant adversity and they were still able to adapt and develop positive behavioral outcomes (Luthar, et al. 2000). The term ‘resilience’ has been used in research literature when describing three different types of outcomes; 1) despite having high-risk factors having good developmental outcomes, 2) having sustained competence under stress and 3) being able to recover from trauma (Werner, 1995). Exposure to significant adversity would include traumas such as poverty, homelessness, parental divorce, abuse, disabilities or other negative social events.

A developmental definition of resilience involves two distinct parts. First, the threat to normal or accepted development and second, the quality of the adaptation or outcome based upon accepted societal expectations (Masten et al., 1998). The psychological aspect of resilience is concerned with the behavior exhibited and its adaptation to the environment. Protective measures such as mentoring, friendships and other social programs mitigate the effect of individual vulnerabilities and provide opportunities for adaptation to occur in society. These measures do not guarantee that behavior will be resilient but only encourage or assist behavior to become resilient. In some cases the problem of adaptation may be so severe or adverse that protective measures are not effective. Resilience is not a rare trait but one that is ‘ordinary’ and widely dispersed across a normal population group (Masten 2001). In an effort to understand the process of resilience, researchers are looking at risk-factors, the developmental outcomes and the protective factors that affect the outcomes and the process in which these factors interact.

One such study that looked at developmental outcomes over time is the Kauai Longitudinal Study. This is a multiethnic study of 698 children born in 1955 in a high risk community on the Hawaiian Island of Kauai. The fathers were laborers, working in the sugar and pineapple fields and the mothers did not have a high school education. The goal of the study was to follow all of the individuals through the pregnancy, birth and on into adulthood, documenting all of the perinatal complications and adverse rearing conditions as the individual developed and adapted to life. The specific time intervals were established to coincide with specific developmental stages of life; the prenatal period through birth and at the ages of 1, 2, 10, 18 and 32 years. The impacts of numerous biological and psychosocial risk factors were monitored by a team of pediatricians, psychologist, public health nurses and social workers (Werner 1993).

The life events and conditions that could have a serious effect, causing an individual to be susceptible to negative development, included perinatal stress,
poverty, parental psychopathology, and disruption of their family unit (Werner 1993). As the study progressed the team was able to assess for positive or negative outcomes after exposure to adverse risk factors. They also looked at the basis for resilience and the protective factors that helped the troubled children in their recovery as they became adults. In this study, of the 201 children identified as high-risk, there had been moderate to severe perinatal stress secondary to poverty. Other risk factors included chronic discord in the family environment and parental alcoholism or mental illness. Many of these children had experienced four or more risk factors by the age of two. Those children had serious learning or behavioral problems by age 10. By the age of 18, they had developed mental health problems, had delinquency records and or teenage pregnancies (Werner, 1993).

Of the 201 identified as high-risk, there were 72 children that were resilient to the risk factors and grew up to be competent, confident, caring adults (Werner, 1993). The 72 resilient individuals had many ‘protective factors’ in common. As infants and on into childhood they had inner qualities which made it easier to get positive adult interaction and were ‘good natured as well as easy to deal with’. They were not separate from their caregiver for a prolonged period of time in the first year of life. These infants also had developed a close bond with at least one of their caregivers. In school they were sociable and had better reading and reasoning skills than the other children. They were not necessarily the smartest students but they worked hard and used whatever skills they had effectively. These resilient children had outside interests, hobbies and activities which helped them developed a positive self concept. They also pursued adults outside of the family to provide the nurturing and support that was often missing in their lives. Teachers and other adults in the community served as role models (Werner, 1993). It should be mentioned that the majority of the children were born healthy and without perinatal complications. The children lived in a supportive environment, had few stressful events or risk factors and developed normally into adulthood. This study showed that there are protective factors that allow individuals to develop positive outcomes even when faced with severe adverse events in their life.

The Kauai Longitudinal study had identified many risk factors including learning disabilities. When students struggle in school, there is the potential for negative outcomes such as poor self concept and becoming a school drop-out. A measure often used to measure positive development is success in school. Most definitions describe learning disabilities as a group disorder that affects the ability of the person to effectively listen, speak, read, write or do math, either in one’s work, personal or emotional functioning (Gerber et al., 1994). Miller (2002) studied college students with learning disabilities. The study group consisted of ten students that had met the design criteria. The
students had average to above average intelligence and identified learning disabilities. Also, the discrepancy between their learning potential and actual achievement was not due to sensory, emotional or environmental causes. The students were interviewed individually during a two hour session with the use of open ended questions. Students had to recall memories about their school years from elementary school to the present. Since it was expected that students with learning disabilities would have average to below average grades, students with B+ or better, were identified resilient. Each interview was analyzed, identifying consistent patterns between the resilient and non-resilient individuals (Strauss et al., 1990). Themes such as identifiable success experiences, self perceived areas of strength, self determination, verifiable life turning points, special friendships, encouragement from mentors and teachers and self acknowledgment of the learning disability were ways in which learning disabled individuals believed they overcame their problem and eventually accounted for their resilience. Resilient students could identify steps such as encouragement and small successes which gave them more confidence. Special friendships made a difference in resilient individuals since a friend would provide a ‘boost’ in their spirits when they were frustrated. Less resilient students did not have that one friend they could count on nor did they have a special relationship with someone who could help.

Resilient students also had teachers or other personnel that helped them out by providing them additional attention in specific ways that complemented their need for learning. Mentors play a pivotal role in enhancing children and adolescents who are deficient in important relationships and identify positive actions in their lives which enhance resilient behavior. Non parental adults provide support, communicate moral values, teach knowledge and skills as well as inspire (Hirsch et al., 2002). Less resilient students felt the pain of some educators that would not or could not help them due to their disability. This study also highlighted the effects of friendship and mentor or adult support as protective factors leading to positive development.

The foster child population of children experiences a significant amount of adverse events early in their lives. They have been removed from their home and separated from one or both of their parents and are victims of abuse or neglect. There may have been drugs or violence in the home and are often placed in multiple foster care homes. There is also a stigma associated with being a foster child (Hines, et al, 2005). Resilience and the transition into adulthood for former foster care children were examined to determine how resilience influences academic success when factors such as the individual, the family and the community collaborate to mitigate adversity (Luthar, et al., 2000). The research method consisted of an in-depth qualitative interview; lasting at least two hours and was conducted with each of the 14 participants. An interview guide was used to collect information about their educational
experiences through the 12th grade, experiences in their family as well as the foster care system. Information about relationships and social support was also included. This study was designed to look at factors contributing to the academic success of former foster care students attending a four year university. Typically, foster children have a high degree of academic failure, homelessness and dependence on unemployment or public assistance (Cook, 1991). Special attention was focused on the emotional adjustment of the individuals and their hopes for the future. Participants were selected on the basis of their response to a question on the financial aid questionnaire; that they had been a ward of the court until age 18. Of the 123 students identified, the final sample consisted of 14 participants. The study group was ethnically diverse and the respondents had spent, on average, nearly eight years in the foster care system. These college students ranged in age from 19 to 35 year old, mean age of 23.4 years. The average was three foster placements but it ranged from 1 to 15. At age 18, 12 were emancipated from the foster system.

The analysis of the interviews provided many common threads about the personal characteristics of these students. They were independent and self-sufficient. They were assertive, protecting themselves emotionally and physically from harm. These students were able to accept help and encouragement as well as ask for help. They described themselves as goal oriented and determined to succeed. They also made a conscious effort to make changes in their behavior or self-image. They wanted to be ‘normal’ like their friends. The fact they were in foster care was a guarded secret. A majority of the subjects spoke of the importance of friends and the role of significant others including parental substitutes as positive role models. Counselor and social workers were also noted to have provided assistance. High resilient respondents claimed that institutions like schools and the foster care system saved them or changed their life for the better by allowing them to have more friends, positive relationships with others and a chance for an education.

The analysis also concurred with previous studies, as those mentioned above in the Kauai Longitudinal study that these participants had protective factors including intelligence, an optimistic personality type and were resourceful. They were easy to get along with active in sports and in extra curricular activities (Hines, et al, 2005, Werner 1993). However, the research suggests that an individual can adapt successfully in one developmental domain and still have problems in another. About a third of the participants experienced feelings of anxiety, stress and other pressure related to finances and living arrangements. They also were depressed about their past childhood experiences as well as a lack of connection and identity with family members (Hines, et al, 2005).

The results of the study indicate that individuals can make a difference in their environment and move away from chronic abuse. Areas of human de-
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velopment like individual assertiveness, independence, ability to accept help, making conscious choices and goal orientation aid in the process. Resilient behavior can be assisted by individuals, family and institutional organizations by providing students a bridge to successful functioning in their world. All these forces operated in tandem to allow a chronic at risk group to achieve behavior consistent with resilient attributes toward everyday life. The study implies that intervention can promote healthy functioning along a developmental time line in the latter years of a child’s life (Luthar 1999, Hauser et al., 2007).

The research presented thus far has focused on the developmental side of resilience or the behaviors of the individual. Is the individual at risk? What are the types of adversity they face? Is there competence and protective factors identified? Researchers were trying to identify and understand how some individuals become resilient to adversity and succeeded in life with positive developmental outcomes. Researchers in resilience have also been looking for regulatory systems and the processes that could explain the outcomes. If systems are to be identified and applied there has to be a method to evaluate the individual. Going back to the definition of resilience, the criteria for judging if the process exists would be to meet the two criterions; has there been a significant threat to the individual and has there been a positive adaptation; second is there a positive outcome above what would be expected under the conditions (Masten, et al, 2006).

Some researchers are taking it a step further and looking at the biological responses to psychological stressors and observing the central neural and peripheral response. We have a primitive response mechanism in our body that some researchers feel dates back to the Stone Age. As an example, under stressful conditions, glucocorticoid is secreted. Excessive amounts of this substance can lead to many chronic health conditions such as insulin resistance and diabetes and bone loss. Another familiar mechanism is the ‘flight or fight’ response. When an individual encounters an extremely stressful or frightening situation, epinephrine is secreted. This will cause the individual’s heart to beat fast and accelerate his breathing and perspiration. Prolonged stress response such as this may have an effect on the autoimmune system and make and individual more susceptible to infections (Boyce, et al, 2005). Some researchers’ feel that these mechanisms are no longer needed and that the constant state of heightened alert is detrimental to an individual’s health. Further research is needed to fully understand the mechanisms and the natural occurring processes that work as a check and balance.

In summary, resilience is clearly a process. In the studies, no two individuals had the same exposure to severe adverse stressors. Events happen at different developmental stages in life and the individuals are armed with different
protective factors. How an individual will respond to a given exposure to adversity is truly unknown. From the research we do know that having certain protective factors in place will help the individual develop on a positive trajectory. A close personal bond with a primary caregiver, supportive adults that will mentor, be a role model, provide encouragement and advice and close personal friendships all help with positive development. There is research that suggests protective factors as a child does not necessarily provide the same protection as one grows older. That positive development in one domain/function does not insure an overall positive outcome.

Mentors enhance resilience in children and adolescents. The Power Rangers developed close personal friendships with each other. They also had a mentor, Zordon, that guided and advised them when the going got tough. There is a bond between the Rangers and their mentor. Resilience does not come from rare and extraordinary sources, or powers, but from ‘ordinary, normative human resources in minds, brains and bodies of children, in the family and relationships and in the community’ (Masten 1998).

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References


Why Can’t Anybody Find Michael Scott Somebody to Love?

LAUREN IRWIN

Michael Scott, the Regional Manager of Dunder Mifflin’s Scranton branch, insists that his employees think of him as a “friend first, a boss second, and probably an entertainer third” (The Office, 24 Mar. 2005). Such declarations only highlight Michael’s loneliness and social rejection. Despite his position as branch manager, few respect his authority; even fewer consider him a friend, and no one thinks he is funny. Such shortcomings in adulthood may be a result of varying influences—from relationships with parents to genes and their interaction with the environment. Generally, strong parent-child attachments (characterized by enduring emotional bonds characterized by trust and support) formed early in childhood development result in individuals with confident adult personalities and successful relationships; weak attachments result in social incompetence and a need for approval. Gene-environment interactions also shape personality and behavior. Individuals who are highly sensitive to their environment and develop in warm and supportive parent-child relationships generally become socially competent and achieving adults, as opposed to those who suffer in insecure relationships, or those who are not highly sensitive and are fairly successful regardless of their environment (Boyce and Ellis, 2008). Therefore, adult personality and behavior is not only determined by early parent-child relationships, but is also influenced by genes and interactions with the environment.

Michael has revealed that he grew up in a broken home and was on a popular kid’s show called Fundle Bundle (The Office, 16 Mar. 2006). Michael grew
up without a stable family or peers to rely on—thus providing the basis for his loneliness. His loneliness is evident as he continuously invites his coworkers to dinner, dreams of having one hundred siblings so that he “can have one hundred friends,” and desperately attempts to form long lasting relationships so that he can have a family (The Office, 16 Mar. 2006). Sroufe (1979) has argued that early relationships in life provide the foundation for all later relationships, because individuals internalize specific patterns practiced during childhood, creating an “internal working model.” Studies have shown that attachment histories are likely to fall into one of three categories—secure (characterized by strong and trusting bonds), avoidant (the child has no real preference between a parent and a stranger), or resistant (the child is easily distressed but not easily comforted by the parent) (Sroufe, 1979). Children’s behaviors and interpersonal interactions in all attachment categories were observed overtime, and little change occurred between infancy and more advanced stages of development (Sroufe, 1979). These observations support the claim that early parent-child attachments can be influential in molding individual development, because of the correlation between adult personality and childhood environment. It is possible that Michael’s developmental health was compromised early on by an insecure relationship with his mother, but such correlations are not definitive proof of causation. It is possible that by failing to develop significant relationships at an early age, Michael never developed an internal process to build significant relationships (Sroufe, 1979). Therefore his dysfunctional “internal working model,” as a result of insecure parent attachment, tainted all future interpersonal relationships.

Further complicating Michael’s lack of competence in forming peer relationships is the pattern of victimization which plagued Michael’s childhood and adulthood—as evidenced by his frequent manipulation by his subordinates. After observing thirty eight children interact in peer dyads and with their mothers, outside judges categorized their behavior and their relationships with their mothers. Those who were most frequently victimized were significantly more likely (based on statistical analysis) to have insecure attachment histories (Troy and Sroufe, 1987). Children who are frequently victimized by their peers are usually viewed as being helpless and inept in social situations, which inevitably leads to the exploitation and manipulation of such individuals (Troy and Sroufe, 1987). It is a cyclical effect. The initial incompetence at forming enduring peer relationships leads to children of insecure attachment history to be viewed as helpless. It is then because of this image of helplessness that others exploit their lack of confidence and skill. This victimization serves to reinforce the claim that victimized individuals are helpless, and the cycle continues. Such asymmetric relationships are carried forward in each individual’s “internal working model,” explaining why victimized children, like Michael Scott, continually attempt to make contact with peers, despite being perpetually unskillful in forming relationships. Similarly to early parent-child
relationships, the victimized individual will try to seek reassurance and comfort from peers in times of distress—with peers replacing the role of adults. Due to the internalized model of insecure relationships, they are unable to form strong bonds. Victimized individuals with insecure attachment histories will continue to seek contact, but because of their unorganized attempts at social interaction, relationships continually fail to meet the child’s needs and instances of exploitation emerge (Troy and Sroufe, 1987). Thus the cycle repeats as the Michael Scott types continue to try again and again to establish relationships without success, thus leading to continuous victimization.

The importance of peer interactions is best demonstrated by rhesus monkeys. In times of high stress, mothers limit the amount of peer interaction their children have, in order to protect them. However, these sheltered individuals then have less experience in forming social bonds and are less cooperative and socially incompetent in adulthood (Suomi, 2005). As is the case with humans, social status in primate networks is determined by relationships, and those who are unable to form substantial bonds at a young age are likely to have less status in adulthood (Suomi, 2005). Although in the case of the rhesus monkeys, the social ineptness is not necessarily a direct result of insecure parent-child attachment, but the importance of peer relationships to development is evident. Therefore, the pattern of victimization associated with many children of insecure relationships hinders peer relationship building at an early age and can predispose victimized individuals to less confident and socially unskilled futures.

Furthermore, children who are lonely are more likely to be rejected and victimized—further highlighting the importance of childhood relationships with parents. Parental support and warmth decrease loneliness and increase social competence (Hay, et al., 2004; Dobbs, 2009). In addition to preventing future loneliness and social incompetence, affectionate and rewarding mothers are more likely to have achievement-oriented children, especially when genes predispose certain individuals to being more highly sensitive to the environment (Crandall, et al., 1960). Children who are achievement-oriented display a range of behaviors. At a young age, achievement-orientation may be categorized by a child’s desire to explore independently of its mother. The general definition of achievement-orientation is that an individual will continually persevere in order to accomplish tasks which require skill and effort (Crandall, et al., 1960).

After observing thirty children of preschool age interact with their mothers at home and with others at school, observers marked the degree to which each child was achievement-oriented (at home and school), and the degree to which they looked for and received praise (Crandall, et al., 1960). The results showed that children who are more likely to receive satisfaction and rewards for their
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behavior will continue such behavioral practices. However, if such behavior is not recognized, as is often the case of insecure parent relationships, there is no motivation because there is little benefit. Thus the individual does not generally develop achievement oriented practices because the environment during development did not facilitate these practices (Crandall, et al., 1960). The fact that the amount of achievement-oriented behavior practiced at home and at school did not vary significantly for each individual strengthens the claim that motherly affection and praise can shape more confident and socially skilled individuals.

Despite the importance of peer relationships, parenting styles still have a significant effect over the success of offspring. Over the course of human evolution, selection has favored the emergence of a spectrum of energy allocation in regards to child rearing with $r$ and $K$ selection as the respected end points. $K$ selection is characterized by organisms that mature later, have lower fertility rates, live longer, have increased parental care, and is hypothesized to have developed in more stable environments. However, $r$ selection is thought to have developed in unstable environments; $r$ selected organisms are characterized by short life spans, rapid maturation, high fertility rates, and reduced parental care (Belsky and Draper, 1990). Humans are the most $K$ selected of all primates as a high degree of male parental investment is rare in most mammals (Belsky and Draper, 1990).

In general human males contribute more than just sperm to reproduction. Males are likely to form lasting pair-bonds and expect to be involved in the rearing of the child, but the norms of parental care are highly variable between cultures (Belsky and Draper, 1990). Different styles of mating behavior in humans depend on the context of an individual’s prior relationships. It is quite likely that a mother’s pair bond status will serve as the “developmental switch” for her offspring, meaning that an offspring of a securely pair bonded mother is likely to seek a similar relationship characterized by cooperation (Belsky and Draper, 1990). Mothers in insecure pair bonds are likely to have insecure parent-child relationships as a result of external conflicts, so offspring are less likely to invest in secure pair bonds and therefore the cycle will likely repeat (Belsky and Draper, 1990).

Belsky and Draper (1990) hypothesize that selection has favored individuals who can alter their behavior in response to their environment, meaning that they are more highly adaptive, this is also known as “adaptive phenotypic plasticity.” This hypothesis favors $K$ selection in stable environments and $r$ selection in unstable environments. For example, some birds alter their mating strategies between monogamy (stable) and polygyny (unstable) depending on the quality of resources in their environment, emphasizing the flexibility associated with looser pair bonds and early maturation (Belsky and Draper,
The dynamic nature of development, with the ability to adapt to environmental conditions, is also found in humans. The varying reproductive and parenting styles are not only influenced by each individual’s past relationships or genes, but also by the stability of the environment, thus providing an alternate explanation for insecure attachment.

Although attachment theory and adaptive parenting styles provide an excellent explanation for child development, the influence of genes cannot be underestimated. Recent studies have proposed that individuals may inherit one of two genetic influences— the “orchid” or the “dandelion” influence. Those with the “dandelion” influence are more robust. This means that regardless of their environment (strong or weak attachment) they will most likely develop the same; they are sturdier, and are less sensitive to external factors (Dodd, 2009). Those with the “orchid” influence are more highly sensitive to their environments. If they are raised with strong attachments they will thrive, but if they are raised with insecure attachments they will suffer (Dodd, 2009).

This discovery has allowed development to be explained by more than just past relationships and environmental factors. Selection has favored those who invest in both “dandelion” and “orchid” children as there is a greater chance that their children will succeed (Dodd, 2009). The vulnerable “orchid” influence continues to survive because it can be useful in certain environments. For example, by staging interventions in insecure parent-child relationships (mothers were taught techniques to improve the strength of their bond with the child), “orchid” children responded much more positively than did “dandelion” children (Dodd, 2009). Therefore, “orchid” children are more likely to be sensitive to all experiences, thus providing the opportunity to excel or fail depending on the environment. The existence of “dandelion” and “orchid” children provides an alternate or complementary explanation, to understanding human developmental pathways. Development is not predetermined by genes or by parent-child relationships, but by the interaction between the two.

Children of insecure relationships usually suffer from neglect because of inconsistent parenting behavior, and begin to view themselves as unlovable and others as undependable (Sroufe, 1979). In addition, children of such relationships are more likely to reach puberty at a younger age because human evolutionary history has allowed for variable adaptation in mating and child rearing behavior depending on the environment (Belsky, et al., 1991). Belsky, et al. (1991) refers to a study in New Zealand which demonstrates that familial conflict at age seven significantly predicted early sexual maturation, highlighting the variable effects of the environment on development. Rapid maturation increases reproductive fitness by providing more opportunities to reproduce— as opposed to maturing later and devoting a significant amount of time to one pair bond and a few offspring (Belsky, et al., 1991). One explanation for such
early maturation, besides increased opportunity for reproductive success, is that males from insecure relationships do not anticipate forming long lasting pair bonds, and therefore do not plan to allocate a significant amount of resources to child rearing. These individuals are consequently less focused on the long term costs associated with sexual promiscuity (Belsky, et al., 1991). This trade off, in favor of the quantity of offspring rather than quality, enforces the claim that human evolutionary history favored rapid sexual maturation in unstable environments.

Despite the influence of parental relationships on pubertal timing, other factors like genetic inheritance and socioeconomic status can effect sexual maturation (Ellis, et al., 2007). For example, children of parents who experienced early puberty may inherit the same genes and will also mature at an early age (Belsky, et al., 1991). Such genetic dispositions may reflect past environments characterized by instability. Additionally, low socioeconomic status will likely create more stress in the form of financial burden. Insecure relationships are established as the external pressures monopolize the parents’ resources, lessening the quantity of energy allocated for child rearing (Ellis, et al., 2007). The varying effects of genetic and environmental factors on maturation provide further evidence supporting the hypothesis that humans evolved to be sensitive to specific environmental conditions. Stable and unstable environments direct the individual’s development and reproductive strategies towards vastly different paths (Ellis, et al., 2007; Belsky, et al., 1991). In stable times, families tend to be intact and provide more care for each child, maximizing quality rather than quantity. These children mature slower and attain a larger body size (Belsky and Draper, 1990). This higher initial investment is beneficial, because the expected lifespan is longer. However, in unstable environments, it is better to mature quickly. Expected life span is shorter, and offspring quantity rather than quality is favored (Belsky and Draper, 1990). Early childhood experience in parent-child relationships can thus affect more than just social relationships; reproductive strategies are also altered in response to the individual’s environment in hopes of increasing the individual’s fitness.

In the cut throat world of midsize paper companies, Michael Scott somehow defied all odds by arriving to his managerial post, despite being ill suited for such a position. His desperate quest for meaningful friendships and romantic connections cannot be blamed solely upon his own follies and social faux pas. It is likely that Michael suffered from an insecure relationship with his mother, thus inhibiting his social skills and self confidence, leaving him unable to form secure bonds of his own. It is not that an insecure parenting style is “bad,” such techniques persisted throughout evolutionary history because of their effectiveness in certain environments, but insecure parenting is often detrimental to highly sensitive (“orchid”) individuals (Dodd, 2009). Insecure pair bonds may be the result of r (favoring quantity over quality) rather than
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*K selection* (favoring quality) and early maturation may have also influenced his parents’ approach to child rearing. No single factor destined Michael to a life of social incompetence and loneliness; rather the combination of genes, environment, early peer and parent bonds, as well as timing of maturation all played an important role in shaping the individual who is Michael Scott.

In keeping with the theme of “The Office,” I will channel my inner idol, Dwight Kurt Schrute. Dwight once said: “When my mother was pregnant with me she discovered that she was having twins, when she went back to the doctor they discovered that I had reabsorbed the other fetus … I believe his tissues have made me stronger. I now have the strength of a grown man and a little baby.” I was never a twin at any point in my life, but I would like to think my overly competitive nature is not entirely different from Dwight. Granted, I am a female, I do not own a beet farm, and I am not a paper salesman. I am from the strawberry capital of California, an All-CIF and League MVP softball player, a high school valedictorian, a sister, and a friend. Like Dwight, I am a hard worker, I am diligent, and I am intelligent. I have aspirations for the future, but at this point I am excited to be pursuing an undergraduate degree in both Anthropology and History with a possible minor in Urban Planning. Afterwards, I would like to possibly attend Public Policy School, but at this point in my life I am content with not having a definitive plan. I am enjoying the present and am proud to have successfully completed my first year of college.

References


Imaginary Friends With Developmental Agendas

Marro Park

Nobody understands. Susie told on me for writing on her dress. Moe took my lunch money. Miss Wormwood sent me to the Principal’s office. Again, again, again. I forgot to shovel the walk; Dad’s going to flip. Mom must have seen the report card by now. Heck, the only thing that’s keeping me from running away is the thought of Hobbes living without a best friend. Who’d feed him? Who’d travel through time with him? Who’d recite his tiger hymns? That mangy feline. Can’t wait to go terrorize the block with that rascal.

So begins another afternoon for Calvin of Bill Watterson’s Calvin and Hobbes. Like Calvin with his stuffed tiger, human minds everywhere construct imaginary interactions. We openly interact with non-existent contacts, like slamming computers that must be screwing our lives by deliberately offering slow Internet connections. Imaginary interactions are especially apparent in children, who seem to extend invisible interactions beyond just speaking to themselves or with objects—they create imaginary friends. An imaginary friend is an invisible character with a defined personality whose relationship with a child is based in the child’s perception of reality (Manosevitz et. al. 1973). I have experienced the companionship of an imaginary friend and can testify to how real my relationship felt. Like Calvin, I had personified a stuffed animal (a Snoopy doll named Snoopy), clothing it with handmade shirts, brushing his sewn-on teeth, and venting my day-to-day frustrations to his ever-happy smile.

An unexplainably powerful desire for company and interaction preceded my creation of Snoopy. Caused by more than just loneliness, my imaginary friend satiated my needs for a motivator, an adversary, someone to care for, and
a person to reciprocate learned social roles to (such as the relationship between a teacher and a student). While children in hunter-gatherer societies may have had ample interaction due to cultural and environmental restraints, children today are reared in a society where parents are often both at work and neighbors are separated by solid walls. Human social development may require certain amounts of interaction, and so modern children, then, may create these imaginary friends to compensate their lack of interaction. I believe and will argue in this paper that children create imaginary friends to aid their social development (such as identity formation and establishment of morals) when the current environment lacks necessary outlets for interaction.

Children of hunter-gatherer societies constantly interact with family, neighbors, and peers: a luxury modern children have lost, necessitating the creation of imaginary friends to compensate. Unlike society today, where divorce rates sharply increase before declining steadily with age (Divorce Rate), separation frequencies constantly decrease with age in hunter-gatherer societies, with men more likely to engage in extramarital sex early in their reproductive careers rather than later (Gurven and Hill 2009). Even when rare divorces or death occurs, hunter-gatherer children are not left in social deprivation, as men often took custody of the children after maternal death or divorce and provided particularly extensive support (Gurven and Hill 2009). Though disruption of the immediate family does not necessarily induce children to compensate and create imaginary friends, the idea that parents are in constant view to hunter-gatherer children poses a stark contrast in the amount of social interaction available to children today. Paths of maturity also differ between modern and hunter-gatherer children; while modern society dictates that children should pursue independence and autonomy from parents, hunter-gatherer societies urge newly married “independent” offspring to help parents continue providing for any younger offspring (Gurven and Hill 2009). Children with older siblings, then, do not lose any amount of available social interaction in hunter-gatherer societies when siblings become older and get married while children today do. Because these early humans were raised in an interaction-rich environment, social development may have come to depend on interaction to carry out its processes.

With increasing solitude marring the environments of developing children, the effects of television on an individual’s satisfaction of friendships indicates one form of compensation for the lack of interaction; people fail to realize on some subconscious level that characters on television are not real and use them as an alternate source of interaction. There are things that exist today that the brain has difficulty grasping simply because these things did not exist during the evolution of the brain, or the environment of evolutionary adaptedness. Not a particular place or time period, the environment of evolutionary adaptedness is a collective concept of the selective pressures that gave rise to
human characteristics; rather than an empty tablet that can be written on, the
human mind, evolutionary psychologists have argued, is predisposed to cer-
tain mental mechanisms shaped by selective pressures (Science Encyclopedia).

The brain and its psychological processes, therefore, are adapted to function
in a specific way that may not be perfectly adapted to entities and situations
in the current environment (Kanazawa 2002). An example of the brain’s dif-
culty in grasping things in the current environment is the effect of pornog-
raphy on men. Men view pictures and videos of naked women and produce
erections, a curious causal relationship because the only biological function
an erection provides is the means for copulation. Why, then, do pictures
and videos of naked women arouse men when the opportunity to copulate
is nonexistent? Because human psychological processes were not selectively
pressured to distinguish image from actual person, the brain innately triggers
the appropriate sexual responses (Kanazawa 2002). Ancient males were paid
in reproductive terms to produce erections whenever they saw anything that
looked like a naked woman, a process that still lingers in males today. Televi-
sion might produce a similar effect, causing viewers to experience interaction
with characters on the screen. The mind cannot identify the artificiality of
said characters on some subconscious level, and due to the lack of a plentiful
source of interaction, our minds may readily accept these semi-real interac-
tions as real ones.

Kanazawa (2002) investigated the effect that television had on human minds
and perceived interaction, predicting that television viewing will cause view-
ers to feel like they had more friends (real friends + artificial “perceived”
friends from television). The annual US General Society Survey allows a test-
ing of Kanazawa’s prediction. The Survey conducts personal interviews to
establish a representative sample of US adults, gathering a sample size of
1500 people per annual survey. Controlling various variables, the Survey asks
its respondents how satisfied they are in different areas of their lives, includ-
ing the area of friendships, on a 1 through 7 scale, 1 indicating no satisfac-
tion and 7 indicating extreme satisfaction (Kanazawa 2002). Satisfaction with
friendships was defined by the study as spending time with and having lots
of friends (Kanazawa 2002). The results of consecutive surveys between the
years of 1986 and 1993 consistently reported that increased television view-
ing seems to result in positive effects on friendship satisfaction. Controlling
for the same aforementioned demographic variables, men and women who
watched more television during these years reported higher levels of satisfac-
tion with their friendships to the US General Society Survey (Kanazawa 2002).
Television viewing seems to cause viewers to feel like they have more friends
and spend more time with them, providing strong evidence for Kanazawa’s
prediction, as well as the idea that children today use television as a source of
interaction—a source that was once only offered by other humans.
Calvin loves television. He leaves the machine only to play with Hobbes, promptly returning to his living room couch after every activity. Consumed by visual media (Figure 1), Calvin floods his brain with artificial friends (he routinely shouts and speaks with characters on the screen), which may be the reason he is so comfortable with having virtually no real, human friends.

The fact that imaginary friends occur at higher frequencies in first-born children (who have no siblings to interact with) (Manosevitz et. al. 1973) also provides evidence that imaginary friends aid development in interaction-deprived environments. A study in 1973 attempted to discover what effects a child’s family had on his or her development of imaginary friends. Two hundred twenty-two preschool children, pooled from nine nursery schools and care centers, were divided into two groups (one for children with imaginary friends and one without). The parents of each child were given questionnaires regarding nuclear family composition, parent occupation, number of playmates the child had, toys owned, difficulties playing, and parental opinion of the child’s ability to interact with others (Manosevitz et. al. 1973). Parents who reported that their child interacted with an imaginary friend were given a second questionnaire, in which the nature and personality of the “friend” were reported. The results indicated that the two groups children were surprisingly similar. Parental divorce and separation frequencies were negligibly different between the two groups, indicating that nuclear family disruption is not a significant factor contributing to imaginary friends (Manosevitz et. al. 1973). Other factors that were similar between the two groups include pet choices, number of playmates, types of activities, and frequencies of behavior problems. Where the two groups differed significantly was in the frequencies of firstborn children and degrees of self-initiation. The majority of imaginary friend cases occurred when the child had no siblings, and children with imaginary friends were reported to be relatively livelier and more proactive in their playing (Manosevitz et. al. 1973). One of the implications that the study suggests is that imaginary friends compensate for lack of interaction. Imaginary friends of firstborn children were reported to appear in adult-heavy environments (where there lacked the presence of an appropriate peer) and disappear a few months after a sibling was born (Manosevitz et. al. 1973). With new siblings, children may no longer need an imaginary friend to satiate their needs for social interaction. Interestingly, the reported lively and proactive behavior in children with imaginary friends also indicated that these children were possibly better able to engross themselves in playing that might be due to greater creative or innovative skills (Manosevitz et. al. 1973); this can explain why firstborn children do not all construct imaginary friends, as a certain degree of imaginative skills may be required to effectively create one. However, no quantitative measures of this conclusion were reported.

Calvin may very well have created Hobbes because he is an only child with-
out any real friends to compensate for the lack of a sibling. His peers at school despise him (one particularly enjoys putting Calvin in lockers for the entire day), while his teachers deem him a menace and turn their backs. Back home, his parents do little to alleviate his longing for company. They lack the parental courtesy of producing Calvin a sibling, as well as allowing daily leisure activities to precede the basic necessities of their only son (Figure 2).

Social development from interaction, then, must be necessary in human beings, as our minds go so far as to create imaginary friends to ensure sufficient interaction is provided to us. One developmental function that imaginary friends perform is identity formation in children; children, through interactions with imaginary friends, learn to identify and distinguish different social relationships, such as labeling one’s mother as a nurturer and a friend as an equal peer. Gleason (2002) conducted a study to investigate children’s perceptions of their social relationships, predicting that children with imaginary friends will be able to more distinctly identify and differentiate between different social relationships. For the study, sixty 4-year-old children were gathered and broken into three groups of twenty: children with imaginary friends, children with personified objects, and children with neither type. Imaginary friends were defined as characters children refer and interact with without the presence of tangible objects; on the other hand, personified objects were defined as objects that children treat as real, living things, excluding items that were simply carried around such as a blanket (Gleason 2002). While parents of the children filled out background questionnaires, the experimenter tended to the children directly, reading a story to create a comfortable environment. The children were then presented with drawing tools to construct pictures of their parents, best friends, and imaginary friends (children without imaginary friends were asked to draw a close sibling). These drawings were then used to conduct a relationship interview with each individual child; two of the subject’s drawings were placed before the subject while the experimenter asked him or her to define a specific social relationship (e.g. Who comes to you for help with things he or she can’t do alone, your mom or your brother?) (Gleason 2002). The results indicated that children with imaginary friends identified social relationships correctly (e.g. parents as sources of authority and aid, friends as sources of conflict) significantly more often than children with personified objects or without any imaginary friends. The latter two groups more or less selected social relationships at random (Gleason 2002). Gleason suggests that children with imaginary friends identify social relationships better due to the “perspective-taking” that occurs when interacting with imaginary friends; by performing both sides of a relationship, children experience the existence of other perspectives outside their own. The recognition of different perspectives and the ability to put oneself into the position of another may be critical components of social development and identity formation (Gleason 2002). Identify formation develops within interaction, and modern social
deprivation has necessarily allocated imaginary friends the task of providing said interaction.

Beneath their juvenile and delinquent appearances, the interactions of Calvin and Hobbes represent a dynamic spectrum of social relationships. Depending on the situation, Hobbes may be a friend, an adversary, a political cohort, a copilot, a sports team member, a source of terror, or a roommate (Figure 3). Calvin’s ability to paint so many “faces” on his stuffed animal exhibits his inherent and thorough knowledge of social relationships.

Another developmental function that interaction, provided by imaginary friends in today’s socially-deprived environment, performs is the establishment of moral self-standards; children learn to “play by the rules” by interacting with imaginary friends that either act as consciences or friends to provide moral guidance to. Hoff (2004-2005), to better understand and attempt to generalize functions of imaginary friends, interviewed twenty-six 10-year-old children in two rounds. In the first round, unstructured interviews, where no questions were specified in advance, were conducted for only twelve of the children. These initial subjects were encouraged to speak of anything the children wished to convey about their imaginary friends. From this first round of inquiry, some structured interview questions were generated. The second round of interviews, conducted to all subjects, used these questions, while also permitting each interviewer a degree of flexibility to stray from set topics or to pursue parts of each interview in depth (Hoff 2004-2005). Searching for patterns and common themes of imaginary friends, Hoff noted that the function as a moral conscience was prevalent in many of the conducted interviews. One subject recalled an instance where his imaginary friend punished the subject for not answering his summons (a misdemeanor that resulted in a 5 minute time out), while another subject admitted to being stopped by her imaginary friend when a game of teasing had gone too far (Hoff 2004-2005). Imaginary friends perform the function of self-guides until the subject conducts these mental processes on their own, working as a transitional step between being told what is right and knowing what is right (Hoff 2004-2005). A reversal of roles appeared to be very common as well, where the subject children were more morally responsible and had to stop their imaginary friends from going over the top. One subject related how she was forced to stop her imaginary friend from stealing candy, allowing her to take only one piece (Hoff 2004-2005). A distinguishing developmental task for 7-to 10-year olds involves learning to play by the rules (Hoff 2004-2005), and by enforcing a set of regulations on their imaginary friends, children internalize those regulations into moral self-standards, discerning right and wrong for themselves. Imaginary friends provide the necessary interaction to carry the development of internalized morals to fruition.
Calvin is a menace, and he knows it. If Hobbes is the externalized portrayal of Calvin’s conscience, it becomes apparent why the kid gets into so much trouble; rather than clearly telling Calvin what is right or wrong, Hobbes merely questions his motives (Figure 4), never stopping Calvin’s actions but reluctantly supporting him. This may reflect that Calvin possesses a distorted sense of moral self-standards, never having assimilated a clear idea of morality.

Hoff’s study goes on to describe many other social developmental functions of imaginary friends, including mentoring, comforting, bolstering self-esteem, motivating, enriching lives, and expanding personalities (Hoff 2004-2005). Interaction binds these functions by a common thread, as these social developments occur through a child’s interaction with another being. Our ancestral roots were enriched with social interaction, where children saw children everywhere, where mothers were but a stone’s throw away. The advent of the iron jungle and the consequent social deprivation in the environment, however, did not stop social development—it persevered with imaginary friends.

Many of the aforementioned research speculated on other functions of imaginary friends outside of social development. One study proposed that the creation of imaginary friends could help satiate a desire for peer attention (Hoff 2004-2005), while another suggested that imaginary friends be a simple vessel designed to alleviate loneliness (Manosevitz et. al. 1973). I have also come across a split in opinion regarding whether or not imaginary friends induce a negative effect on a child’s social skills; Gleason’s (2002) study revealed that children with imaginary friends outperformed peers without imaginary friends in terms of openness and desire to make friends, as well as tending to be more cooperative in groups, while Hoff (2004-2005) indicates that there are studies that show children with imaginary friends are generally less socially-adapted. The rest of my research failed to discuss this topic, so I am unable to discern which argument is more viable. Some future study questions offered by my research include whether or not parental child-rearing techniques promote the creation of imaginary friends (Manosevitz et. al. 1973), whether imaginary friend phenomena has a long-range impact on a child’s later development (Manosevitz et. al. 1973), and how differently does a child view an imaginary friend versus a personified object (Gleason 2002).

Does Calvin know that Hobbes is but a medium of social development? No, and that is how it should be. Our minds may create these ornate beings to satisfy a need for interaction, but on the proximal level, imaginary friends comfort us in ways specifically geared toward each individual’s needs. Hobbes, Snoopy, imaginary friends everywhere—they are there when we need them, even when we don’t know we do.
A man named Karthik once asked me, to describe myself, to dig through my memory. He wanted to put me inside of a little book, to begin my research with an engaging little hook.

I wrote lists, I drew charts, to find something that would touch your hearts. something interesting, something bold, something that’ll be read as instant gold.

But I gave up halfway, because I remembered one time, when we were asked what we’d do with a quarter or dime. Or ten dollars, even, and if we’d share, if we’d exhibit altruism that, today, is so rare.

I remember the uproar and the words of shame; You were all upset with me and the dictator game. I’d demand half but give little, and just because of that you chose to belittle.

Well let me tell you; you’d all do the same, if the scenario was real, if it wasn’t a game. If any of you were granted undeniable riches, you’d all be greedy little sons of bitches :]

...Just kidding. Great class, great professor, awesome quarter. Thanks, everyone.
Figure 1: Calvin enslaves his own mind to television. Calvin and Hobbes ©Watterson. Used by permission of Universal Uclick. All rights reserved.

Figure 2: Calvin attempts to get his father’s attention, only to be sent to his room and left with only his imagination to comfort him. Calvin and Hobbes ©Watterson. Used by permission of Universal Uclick. All rights reserved.
Figure 3: (From left, right, to bottom) The many faces of Hobbes: copilot, team member, and political cohort. Calvin and Hobbes ©Watterson. Used by permission of Universal Uclick. All rights reserved.
Figure 4: Hobbes knows when ideas go bad. If only Calvin shared that same insight. Calvin and Hobbes ©Watterson. Used by permission of Universal Uclick. All rights reserved.
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Divorce Rate. 7 June 2010 <http://www.divorcerate.org/>.


Cars Have Feelings Too: Lightning McQueen and Peer Effects

Michael Starr

In the movie Cars, Lightning McQueen is the new face of racing. He’s got it all going for him: good looks, the winning spirit, and the talent to back it all up. However, Cars is not a movie about the success and winnings of its main character. On his way to the Piston Cup (the biggest and most important race of the year), McQueen finds himself in some trouble with the law, and is locked up in the local jail of the small town Radiator Springs. The “locals” surround him, and slowly he becomes a part of the community. Despite starting off as a hotheaded hotshot, McQueen becomes a selfless caring individual by the end of the story. Through his interactions with the cars of Radiator Springs (although required because he was a prisoner), McQueen changes his entire personality. What is it that causes McQueen to change?

It is natural for people to want to associate with others of similar interests and personalities. We often surround ourselves with groups of similar individuals, but is it because we search for those with similar traits as us? Or is it that we are malleable and can change who we are based on the people that surround us? To what degree do we choose who we associate with? Do we change who we are in order to impress others? Essentially, I ask the question, how do groups shape our personalities, and how easily can we be shaped?

In one of John Donne’s poem, he states, “no man is an island.” Essentially, he is saying that everyone is connected in some way or another, nobody is on their own island, completely isolated from the influences of others. The behaviors of humans prove this statement to be true. Whether it is smoking
habits (Christakis, 2008), drinking habits (Levy, 2005), or what we wear every-
day (Wilson, 1998), there is plenty of evidence of how groups, societies, and 
peers affect our everyday decisions. Chartrand (1999) calls it the “Chameleon 
Effect.” Essentially, we mimic those that surround us. Perceiving another’s 
behavior causes us to act in a similar way. The question of why we conform 
then arises. Why do we mindlessly follow the decisions of others, without 
making an educated decision for ourselves? Some call it an informational 
cascade which is when “it is optimal for an individual having observed the 
actions of those ahead of him, to follow the behavior of the preceding indi-
vidual without regard to his own information” (Bikhchandani, 1992). In this 
paper I give a sense of why we are impacted so much by those who surround 
us, following these informational cascades, and provide different forms of 
evidence exposing some of the decisions we make influenced by others.

Before giving examples of external influences on our decisions, it’s important 
to understand why we follow these influences. In high school we strive to fit 
in and be cool, in college we take classes based on what other people say about 
the professors, and many strive to be doctors or professors knowing that they 
will make money in the future. The reasons behind this seem to tie to a very 
basic evolutionary principle—natural selection. Since populations evolve, and 
not humans, we must base our decisions on others simply because we do 
not survive long enough to live otherwise. We don’t have the opportunity to 
live out both sides of every decision, so we must believe that those before us 
are making the correct decision and follow suit. For instance, 60 percent of 
high school students chose the same political paths of their parents (Jennings, 
1968). Obviously it is impossible to live a life as a Democrat and another as a 
Republican and then decide which is better. This is one example of how we 
make our own decisions based on the decisions of others.

Although I have mostly been discussing the effects of groups and multiple 
influences, one on one interaction can also change a person’s decisions. Dur-
ing college, we run into an experience much like that of Lightning Mcqueen’s 
in that we are forced to live with someone who we don’t know and haven’t 
chosen to live with. Drinking alcohol is an activity highly associated with 
most college activities, and can be quite a distraction to one’s studies. Levy 
(2005) noticed an obvious trend among freshmen roommates based upon their 
respective drinking habits in high school. Males who were assigned to a room-
mate who drank in high school suffered a tenth of a point drop in GPA on 
average, while those assigned to roommates who didn’t drink had no change 
in GPA (Levy 2005). Also worth noting is that when two males who stated 
that they drank frequently in high school were assigned together, their GPAs 
dropped by two-thirds of a point (Levy 2005). This article blatantly exposes 
the effects of one-on-one peer influences. This also supports the theory of why 
these influences affect us. A non-drinker paired up with a non-drinker is left
to assume that they both have made the right decision, so neither are affected by the other’s drinking habits. However, when a non-drinker is paired up with someone who drinks, he is left to assume that his roommate has more experience, and is making the correct decision by choosing to drink. Following his roommate’s lead, and prior decisions, the non-drinker is pressured into making a decision with a lack of proper information. As mentioned before, the non-drinker does not have enough time to live one college career with alcohol and one without, so he tags along with his roommate’s decision, and chooses to drink himself—resulting in a loss in GPA.

However, peer effects are non always negative. Falk (2006) conducted an experiment in which he proved the exact opposite. Participants were told to do a basic task and were separated into two groups. Some participants were paired up, and others worked by themselves. Essentially, the participants who were paired up showed significantly higher outputs, even though teamwork wasn’t an option (Falk, 2006). Since the participants who were paired up could see each other’s actions, they could decide which technique was better based on the other’s output, whereas those working individually did not share this privilege. The results show a considerable difference in output between the participants who were paired up and those working as individuals (Falk, 2006). This is clear evidence of not only peer effects occurring, but also working in a positive manner. Merely by working in the same area as another person, the participants were able to work more effectively. Even though neither had prior experience to the task, this has to do with the informational cascade mentioned before, because the participants would follow suit of their partner in order to better their own performance.

High school is a time where informational cascades can be seen at their prime. Incoming freshmen are thrown into what is almost a miniature society of other teenagers who are older and more experienced. During high school we have to make lots of social decisions—drinking, smoking, and dropping out (among others). Peer groups affect all three of these decisions, along with other drug use, and even church going (Gaviria, 2001). Among tenth graders, each of these five choices varied between groups of students, yet were similar within each of these social groups (Gaviria, 2001). Although it may seem obvious that individuals within groups would be very similar, seeing how that is what this paper is exposing, there is a very interesting fact this study shows. Going to church is normally a family ritual, something that parents impose upon their children (much like the political beliefs mentioned earlier), however Gaviria’s results show that our peers can have a larger impact on our decisions even than our parents.

Another area in which parents lose influence is clothing. Among sampled 6th, 9th, and 12th graders, Wilson (1998) noticed that peer influences became more
and more of a factor with parental influence decreasing over time. This reinforces the idea that peer influences are even stronger than those of parents. Also, students who lived in more urban areas were more likely to dress similarly to their friends than those who lived in more rural areas (Wilson, 1998). Naturally, the more people who we interact with, the more we will be affected by their decisions. The children who lived in more rural areas weren’t as influenced by group and peer pressures merely because of the fact that there aren’t as many influences in rural districts. In a city area, there are billboards everywhere and name brand outlets on every corner; logically someone living in this type of area will be more affected by peer pressures merely because of the environment.

Fashion and trends are two areas in which “informational cascades” become very noticeable. If American Eagle is known to sell the cutest most in style sundresses ever year, their reputation alone earns them their business, regardless of the look of the dress. All it takes is one person to buy the product, and the cascade can start flowing. However, at the same time, there is a reason most trends don’t last long, and are merely “fads.” Informational cascades can come to a crashing end very easily (Bikhchandani, 1992). Since many trends and fads are popular based on little to no proof (except for numbers), it often only takes a little bit of time to bring these fads to an end (Bikhchandani, 1992). Although fragile, fads are an explicit representation of peer influences. We are frequently influenced to buy commercial goods without a legitimate reason for doing so, apart from the prior purchase of our friends.

Even though fads come and go, certain things are not able to escape the power of group pressures. During the late 20th century, smoking was a habit seen everywhere in the United States D movies, posters, street corners, and even at home. Even though since then, the number of smokers in the United States has decreased drastically altogether, there is still a very noticeable presence of peer influence among smokers (Christakis, 2008). In the 70’s smokers and non-smokers were divided into clusters, however the number of smoking clusters largely outnumbered the number of non-smoking clusters (Christakis, 2008). Now, there is a great majority of non-smoking clusters, but the numbers of members in the smoking clusters are still the same size as they were in the 70’s, “suggesting that whole groups of people were quitting in concert.” (Christakis, 2008). Whole groups quit together, and whole groups stay smoking together. This is one example of how powerful the influences of those that surround us can be. Despite all the research and evidence behind the evils of smoking, peer pressures are too strong to defeat in this case. Granted, cigarettes are physically addicting unlike most other fads, but it is evident that one’s peers not only can influence ones decision to get started (in high school), but also stay smoking. Smoking is an addiction that is possible to stop: even so, peer influences seem to be the main influence that can either
help people quit or support them in their decision to continue smoking.

Some group pressure isn’t subconscious at all, such as Nazi Germany during World War II. This is one example of extremely negative group mentality taking over an entire country. There has been much research as to why and how an entire country could support such an anti-human rights leader such as Hitler. One reason is that they didn’t have much of a choice, by not joining the cause and supporting Hitler (Peukert, 1987). Nazi Germany is a perfect example of group pressure forcing its members not only to join but also think alike. This is almost exactly what happens to Lightning McQueen, except Lightning is changed for the better D which is (hopefully) obviously the exact opposite of what happened to the people in Germany. Both are examples of groups recruiting people (or cars, in McQueen’s case) who normally wouldn’t be member, and also changing their new members’ mentality to their own. Although originally it was mostly authority that forced people to join Nazism, by the end of the war it became apparent that there were too many “supporters” and the group mentality was much too powerful to resist. “Views that had become politically taboo or criminal could be maintained only within the family circle or among close friends, if at all” (Peukert, 1987). Essentially, the group had grown to such a large size that there was no way to say no, and no way to defeat it. Because of this, Nazi Germany is one of the most powerful examples of group pressures in history.

People with power are much more influential within a group in many different cases, not just Nazi Germany. For instance, the spread of smoking contagion was much more rapid among groups of people who were educated when smoking was at its peak (Christakis, 2008). Yet at the same time, these groups of educated people were also the first to give up smoking (Christakis, 2008). As natural as it is to follow the majority in any case, when the group seems to have some power (or in this case an education), people are much more likely to follow the groups ideas.

This phenomenon is seen in animals as well. Animals settling in a new area are more likely to settle close to another and arrange clusters, despite running the risk of competition (Bikhchandani, 1992). By settling first, the new coming animal is left to assume that the first made a good choice of location, and follows suit. This pattern continues on and on, and clusters are formed (Bikhchandani, 1992). Even animals’ actions strengthen the idea behind informational cascades, showing that even without advertising and other propaganda, the most basic of prior “knowledge,” even if it is wrong, can influence decisions greatly.

One last example of peer influences, and is noticed in many animals, not just humans, is laughing contagion. Although laughter is the most famous culprit of this type of contagion, both yawns and coughs have also been found to be
Laughter evolves from our primate ancestors, such as chimpanzees, who use similar noises when playing with each other (Provine, 2004). Also, even though you may think a joke is funny, it isn’t necessarily what causes you to laugh. “The necessary stimulus for laughter isn’t a joke, but another person” (Provine, 2004). Laughter is very instinctual, and something that is difficult to fake, yet for some reason it is unbelievably contagious. In fact, Provine (2004) noticed that laughter was 30 times more frequent in social situations rather than solidarity. This is one of the most clear-cut cases of direct (and practically instant) peer influences on our actions.

I chose to end this paper with laughing contagion to show that our peers heavily influence even our most basic actions and decisions. I also chose Lightning McQueen as an example of someone (or something) that is heavily affected by the people he associates with. He completely changes his personality, slowly adapting to the people of Radiator Springs until he eventually joins them at the end. Peer influences affect us in every decision we make. It may be the person in front of you that helps you decide which sandwich to get at Quizno’s, or maybe your friends convince you that drinking on a Wednesday night is much more appealing than studying. Either way, the external influences from the groups and peers we associate with are constantly affecting our everyday decisions. At UCLA especially, there are 25,000 students, all with different backgrounds, different styles, and different opinions squeezed into a campus that is only a square mile. With numbers like that, peer influences are elevated to the max. I now understand how influential my peers are on my actions, and won’t try to fight these influences, since they appear to be inevitable—they are something we cannot escape. Despite the desire to be individualistic, and “different,” everybody is influenced in some way. It seems that these informational cascades seem to work for the most part, seeing how the human race is more civilized than any other race in the history of the planet. It is the groups of people (or cars) like those at Radiator Springs that keep us going. Knowing that I will be affected by those around me, I only can strive to surround myself with others who will make me a better person. I could use a vacation; maybe I’ll go visit Radiator Springs—they seem to have done a good job with Lightning McQueen.

Michael Starr, hailing from the kingdom of Forestville, California (an empire whose entire zip code boasts 3,800 residents), is a Youtube video connoisseur, beanie baby fanatic, and Pokémon master. Some favorite activities include dancing on chairs, talking in accents, and hearing other peoples’ life stories. Ice cream is his food of choice, however, he says, “Choosing UCLA was the best decision of my life.” However, one has to ask, was it truly your own decision Michael? Or did others push you to come here? The world will never know.
References


Part II

The Mind
and the Brain
You open your sleep-filled eyes, the world still a bit blurry. As you look around, you realize you have no idea where you are. Aged, gray walls surround you and the other side of the bed is empty. “This isn’t my room . . .” you mumble, eliminating one possible location and getting closer to the answer. Quickly, you sift through the drawers to find clues. A Bible. It must be a motel. Next, you grab your clothes laid out on a nearby chair to figure out how you got to this musty motel room. The pockets overflow with notes and labeled Polaroid photos. On your way to the bathroom to assure no one else is there, a glimpse at yourself in the mirror reveals a more permanent set of scrawls; tattoos cover your body ranging from the basic “Eat” and “Never answer the phone” to the cryptic “Remember Sammy Jankis” and the shocking “John G raped and murdered my wife.” Imagine waking every morning to solve the puzzle of where you are and how you got there and rediscovering your wife is dead. That is life for Leonard Shelby of Christopher Nolan’s critically acclaimed Memento, the story of a man struggling to avenge his wife’s murder while relying solely on scribbles and his past experience as an insurance investigator to track him down. “I have a condition,” Leonard repeats throughout the film. Leonard has amnesia.

One night while Leonard slept peacefully in bed, two men broke into his home and raped and murdered his wife. Awoken by a slamming door, Leonard followed his wife’s pain-filled moans just in time to have his head smashed into the bathroom mirror, fall to the floor, and watch his wife take her last breath—Leonard’s last memory. When Leonard woke up from this nightmarish episode, he could not form new memories. Leonard became a victim of anterograde amnesia, or short-term memory loss. Now a slave to the written
word and the availability of pen and paper, Leonard attempts to find John G, the man who attacked him and his wife, and kill him. Leonard’s anterograde amnesia makes his quest incredibly difficult. He must trust what is written on scraps of paper, pictures, and his body along with instinct in order to avoid danger and manipulation by others but also to make important decisions about who to trust and who to kill.

First, in order to better understand Leonard’s amnesia, we will take a look at how memories are organized and how they work to aid us in daily life. By inspecting which parts of Leonard’s memory are still in tact, it will become apparent that despite damage to part of the brain, the rest keeps working. Second, we will examine the different kinds of amnesia and their various causes to realize that Leonard’s failing memory may be a result of a combination of both head trauma and post-traumatic stress disorder.

Leonard’s system of notes acts as a primitive memory system that stores and categorizes important information to make up for the extraordinary tool that is now damaged beyond repair. The human memory system has proven vital to human survival because learning depends on retaining information. Our memories capture, file, store, and recall information to the forefront of our minds when necessary. The knowledge that comes from past experiences helps us to make decisions in the present and not repeat mistakes (Klein et al., 2002). Without the ability to record or store memories, we would have never learned to avoid the bully, Billy, on the playground. There would be no recollection of Billy tripping, kicking, biting, and stealing from us. Without a record of Billy’s pointed aggression, we would repeatedly and unknowingly walk straight into humiliation and danger. We would have no concept of consequences. We would constantly learn the same basic facts over and over again, stuck in a circle of rediscovery, never making progress.

The ability to record and store memories would be just as useless as having no memory if not for a retrieval system. It would be like having a room filled with books and pictures about the past and being stuck outside without a key to the door. Luckily, our memories have a sophisticated retrieval system that unlocks the door, flips through those dusty books and photos, and locates the needed information almost immediately. Of course, this retrieval method’s efficiency is dependent upon organization. The complex human memory system is actually composed of multiple systems. Each system stores specific types of information, categorizing data in a comprehensive manner so as to make the retrieval of information quick and efficient (Klein et al., 2002). Not unlike a library, our memories store experiences, thoughts, and facts systematically.

Memories are categorized into two main groups: declarative and non-declarative memories. Declarative memories are the memories we realize we re-
PhoneNumber, crayon colors, and that time Billy peed his pants in second grade are memories we are aware of having. Falling into this group of conscious memory are three subgroups, or memory systems; semantic memory, memory for general facts dissociated from context; working memory, short-term memory focused on processing the present; and episodic memory, long-term memory for past experiences and events (Klein et al., 2002). Non-declarative memories are the things we know subconsciously like how to drive a car or operate a cell phone (Ashby and O’Brien, 2005). Falling into non-declarative memory are two memory systems; perceptual representational memory, visual memory that records mental images of people and places; and procedural memory, long-term memory that preserves acquired skills and “how to” information (Klein et al., 2002).

Semantic memory, general knowledge memories unrelated to specific events, is memory for facts free from context (Ashby and O’Brien, 2005). The fact that the grass is green and two plus two equals four are general facts disconnected from context and stand on their own. Leonard knows that beds are for sleeping and keys open doors regardless of the circumstances. Leonard’s anterograde amnesia does not affect this memory system, allowing for these general knowledge facts to survive and be accessible on his quest and in his daily life. The problem is that he cannot retain any new information within context or not because of damage done to his working memory.

Working memory focuses on the short-term of the here and now and deals with limited amounts of information during brief moments of cognitive activity (Ashby and O’Brien, 2005). It assists us in manipulating current information in order to learn, comprehend, and reason. Working memory makes

Semantic memory, general knowledge memories unrelated to specific events, is memory for facts free from context (Ashby and O’Brien, 2005). The fact that the grass is green and two plus two equals four are general facts disconnected from context and stand on their own. Leonard knows that beds are for sleeping and keys open doors regardless of the circumstances. Leonard’s anterograde amnesia does not affect this memory system, allowing for these general knowledge facts to survive and be accessible on his quest and in his daily life. The problem is that he cannot retain any new information within context or not because of damage done to his working memory.

Working memory focuses on the short-term of the here and now and deals with limited amounts of information during brief moments of cognitive activity (Ashby and O’Brien, 2005). It assists us in manipulating current information in order to learn, comprehend, and reason. Working memory makes
information temporarily accessible and makes language comprehension and inference possible (Klein et al., 2002). Leonard’s working memory allows him to think and deduce in the present, but he only remembers information briefly. His recollection often fades before he has the chance to jot something down on paper. Despite consciously trying to focus on remembering pertinent information, the smallest distraction disrupts his thought process and rejects his attempt to preserve new facts. Leonard’s system, though resourceful, often fails because it relies on the ability of his working memory; if Leonard does not have ample time to write down information, it fades forever. Though originally thought to operate separately from long-term memory, research has shown a closer link between short-term and long-term memory systems. This link is apparent in patients with clear short-term phonological learning deficits. Phonological learning involves retaining information about speech sounds in language, and those patients with short-term deficits also had trouble learning the vocabulary of a new language over long periods of time (Baddeley, 2000). Working memory is vital in translating short-term memories into long-lasting memories, a key process that seems no longer available to Leonard and other anterograde amnesiacs. Leonard can, however, recall premorbid (pre-injury) memories with the use of his episodic memory system.

Episodic memory records and stores the memories of past events. These memories are completely linked to context, as opposed to semantic memories. Vital to social interactions, episodic memories help humans judge the personality traits of others and correspondingly decide how to interact with individuals based on their past behavior (Klein et al., 2002). This memory system renders useless in interactions with people Leonard meets after his accident and leaves him vulnerable to manipulation by those around him. Leonard, though he cannot discern sincerity based on previous experiences with acquaintances from after his accident, has experience picking out the liars from the truth-tellers from his time working as an insurance investigator. Leonard trusts others using his surviving episodic memory and partially functioning working memory system to apply his experience with human behavior to social interactions in his short-lived present.

Perceptual representational memory, our visual memory, records mental images, images of places, people, objects, etc (Klein et al., 2002). As a part of non-declarative memories, we are not consciously aware of storing these memories. Have you ever seen someone and felt like they were familiar but you just could not place them? Most likely your perceptual representational memory kept a record of the face but the context of the meeting was not accessed.

Finally we have the procedural memory system, a kind of long-term memory,
which maintains acquired skills and “how-to” information (Klein et al., 2002). Skills and step-by-step procedures are subconsciously preserved in this memory system, allowing us to ride a bike without consciously processing every motion once we have learned the procedure as a whole. Leonard’s procedural memory seems to be intact. He remembers how to drive a car, how to read and write, and how to operate a Polaroid camera and telephone. These skills, acquired through practice overtime before the head injury, do not stump him and therefore remain untouched.

Just to recap: Leonard still has use of his semantic, procedural, perceptual representational, and episodic memories though they are mostly restricted to information already collected from his before his accident. His working memory, totaled by John G, does not amount to much except sometimes to give him time to write a note before his brain reboots. So why did some of his memory systems survive the incident seemingly untouched? Why doesn’t Leonard suffer from long-term memory loss instead or in addition to short-term memory loss? Is his anterograde amnesia due to the inability to store new memories or the inability to retrieve newly stored memories? Well, let’s begin by clearing up common misconceptions about amnesia.

The media perpetuates myths that amnesia is something separate from short-term memory loss and that amnesiacs lose their identities. Unfortunately, Memento is guilty of spreading this misinformation. When Leonard explains his condition, he clarifies that he does not have amnesia because he remembers who he is. This is incorrect for two reasons. One being that Leonard does have amnesia; amnesia refers to the loss of memory, encompassing both short-term and long-term memory losses. Multiple variations of amnesia exist. Leonard experiences anterograde amnesia, the preservation of premorbid memories and the inability to form/retrieve new memories. Retrograde amnesia, often referred to simply as amnesia in popular culture, is the loss of premorbid memories with the ability to form new, postmorbid (post-injury) memories. Transient global amnesia, a very rare kind of memory loss, involves the sudden, but temporary, loss of both short-term and long-term memory (Scoville and Milner, 1957). The second error Memento makes is assuming that patients with amnesia forget who they are. Amnesiacs do not lose their identities; some scientists do not even believe loss of identity is possible (Pendick, 2002). What causes amnesia, however, seems to be accurately portrayed in Memento.

The causes of amnesia vary from physical injuries to the head and post-traumatic stress disorder to epilepsy, strokes, and Alzheimer’s disease. As we know, Leonard suffered severe head trauma at the hands of John G, resulting in the loss of his short-term memory. Most likely, the blow to Leonard’s head damaged his hippocampus, a part of the brain vital to learning and converting short-term memories into long-term memories. The famous case of
H.M., a 29-year-old man who suffered from seizures after a biking incident at age 9, established that damage to the hippocampus correlates to short-term memory loss. After undergoing bilateral medial temporal-lobe resection to cure his epileptic seizures, H.M. thought he was two years younger, could not remember recent events, and often spoke of his childhood (Scoville and Milner, 1957). H.M., now suffering from anterograde amnesia, became the most studied patient in brain science. Like Leonard, when H.M. tried to remember information he would concentrate and repeat mantras but as soon as something distracted him the information was gone (Foer, 2007). In addition to anterograde amnesia, H.M. suffered from partial retrograde amnesia for events that occurred over the previous three years before his operation though his personality and intelligence remained unscathed (Scoville and Milner, 1957).

The survival of some memory systems and not others comes down to location, location, location. Leonard’s head trauma only seems to affect the quality and ability of his short-term memory because of its position in the brain. Say, for instance, Leonard’s head smashing into the mirror had resulted in lesions not only to the hippocampus but extended to other temporal cortices in the brain. According to Reed and Squire, injury affecting larger areas of the brain results in retrograde amnesia. Leonard, you could say, lucked out. His past memories survived unharmed. Or did they?

Post-traumatic stress disorder, an anxiety disorder that can develop after traumatic events, and brain trauma are also linked together and result in post-traumatic amnesia. In a study conducted by Feinstein et al., 282 outpatients who recently suffered from traumatic brain injuries were tested for post-traumatic stress disorder symptoms and psychological distress. The results showed that post-traumatic amnesia corresponds with the severity of the head injury. The more damage, the longer post-traumatic amnesia lasted in the patients (Feinstein et al., 2002). The appearance of post-traumatic stress disorder symptoms, like re-experiencing the event, in patients with head injuries directly relates to Leonard, especially because his physically traumatic event corresponds with an emotionally traumatic event: the death of his wife.

Typically, patients do not recall the actual event of injury, but because Leonard’s brain trauma is linked to emotional trauma, this may partially explain his short-term memory loss but also his recollection of the incident. Patients with post-traumatic stress disorder are known to have deficits in short-term memory (Bremner et al., 1993). The body tends to internalize intense emotions related to traumatic events and often responds by reliving the past, just as Leonard relives that night through flashbacks. Emotional memories, processed outside the hippocampus, are difficult to extinguish, even by something as devastating as a head injury resulting in anterograde amnesia (van der Kolk, 1994). Leonard cannot forget his wife’s death and most likely never
will. It is what drives him to press on, to perfect his system of notes, and
to avenge his wife’s death. However, post-traumatic stress disorder extends
beyond reliving the past and contributes to the distortion of memories.

Post-traumatic stress disorder affects memories not only by causing them to
recur but also to change or disappear. At the end of the film, it is strongly
suggested that Leonard’s episodic memory has been greatly altered after his
injury and wife’s death. Leonard racks his brain and flips between two ver-
sions of the same memory with his wife. The two memories flit back and
forth, never fully revealing which one was true. False recall and the alteration
of memories are more common in traumatized people with post-traumatic
stress disorder than regular individuals who do not suffer from severe anxiety
and post-traumatic stress disorder symptoms (Zoellner et al., 2000). There-
fore, it is no surprise that Leonard’s memories are mixed up and confused.
The fact that he has anterograde amnesia signals that his memory systems
are not fully functioning the way they should, though his distorted episodic
memories point to problems due to more than physical injury.

Though scientists disagree about whether anterograde amnesia is due to faulty-
retrieval or faulty-storage, others have recognized that anterograde amnesia
may be more complicated. In 1974, Marslen-Wilson and Teuber recorded an-
esic patients’ prompted (assisted) and unprompted (unassisted) responses
to famous public figures from decades before and after the onset of amnesia.
As it turns out, prompting, or giving the patients hints and clues, improved
patients’ recognition responses for public figures both before and after their
amnesia, though patients did significantly better recognizing those famous
faces from before their memory impairment. Marslen-Wilson and Teuber con-
cluded that were anterograde amnesia due to faulty-storage, the prompting
would not have improved recognition because the memories would not exist
in the first place. They also concluded that were anterograde amnesia due to
faulty-retrieval that premorbid memories should have been affected as well
as postmorbid memories (Marslen-Wilson and Teuber, 1974). The question of
how amnesia specifically impairs memory systems remains, though we have
learned that amnesiacs can continue to learn if their procedural memory sys-
tem is intact.

Amnesiacs can acquire new skills subconsciously through practice according
to a study by Cavaco et al. The study subjected amnesiacs to a series of five
novel motor skill tests repeated over the course of several months. The tests
included how to weave on a manual loom, how to trace geometric features
moving onscreen with a stylus, and how to pour water into a series of specific
graduated cylinders from a specified height. Though the patients believed
they had never completed the series of tests before each trial due to their
impaired declarative memories, over time the amnesiac patients’ improved
performance on the motor skill tests proved that new skills could be acquired and retained by those with amnesia, giving hope for future rehabilitation for amnesiacs (Cavaco et al., 2004). Leonard himself acknowledges that his life is possible through routine and discipline, this mantra echoes in his tattoos: “Have a routine,” “Condition yourself,” “Learn by repetition.” Through repetition, Leonard copes with his amnesia and makes his life, and ultimate goal, possible.

As we have seen, the human memory system is an incredibly complicated network of multiple systems that overlap, work together, and work divided when faced with great injury or distress. Scientists continue to try and understand how our memories work and how they help us learn and process information throughout our lives. Though amnesia prohibits the memory system from functioning at its maximum potential, there is hope for resilient amnesiacs by means of rehabilitation and routine.

When not pursuing her filmic dreams in Los Angeles, Kimberly Vanni can be found at home in Northern California making pottery, sewing fabulous costumes and appreciating the word hella.

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When human intelligence is brought up in today’s society, it is usually understood as being unique from that of all other animals. It is often said that our intelligence is what sets us apart from the more “primal” animals in the world, but in reality our intelligence might actually be linked to many species of animals. Animals that live in complex social groups seem to share an aspect of their intelligence, what scientists call Machiavellian Intelligence. Within these complex social groups lies the “Machiavellian intelligence” hypothesis (or the "social brain" hypothesis). It states that human cognition and brain size have evolved through participation in “intense social competition.” During these competitions, sophisticated strategies are used to manipulate their competitors in order to gain high status in society and superior reproductive success. Other strategies also include survival techniques such as tool use and food accumulation that would help them outwit other members of the group. These tactics are known as “Machiavellian strategies” (Gavrilets et al., 2006). A well known and loved fictional character, Dr. Gregory House, from the popular show “House”, can be used as a concept in the modern world. In this show, House is a man of great intelligence and success, but if humans had not evolved in complex groups, he would not have the intellect to use his famous strategies, like deception and manipulation. Humans and certain animals have similar intelligence that is directly linked to the complex social groups they lived and evolved in, as described in the Machiavellian intelligence hypothesis.

In our ancestral past, Machiavellian intelligence was formed through the selection of complex brains, which were able to manipulate others and form
alliances in social groups in order to gain reproductive success. The individuals who were most successful used certain strategies to attract mates and attain high statuses within the group. As a result, they were more likely to conceive offspring and in turn more likely to pass down genes. Brain size and intelligence increased as the demand for better and more complex strategies were required.

Humphrey (1976) was one of the first men to talk about the theory that primate intelligence stemmed from these complex social groups and sought out to understand the process in which the intelligence occurs. He thought that high-level intelligence associated with higher primates, especially humans, to be a sort of creative intellect whose main purpose was to come up with the “practical invention”. This is better described as species of higher intellect coming up with new ways of doing things, such as coming up with new behavioral strategies or finding new ways of using tools. Though many once believed that this was linked to primates trying to survive in their environments, Humphrey disagrees. He says that life for a primate is fairly easy: they have abundant food, few predators, and can easily just sleep, eat, and play. Similarly he thinks that life of early man, as a hunter-gatherer, was pretty simple and for about 10 million years he could essentially be physically and intellectually lazy. He concluded by saying that the intelligence acquired from participation in social groups can only be acquired in communities “which provide both a medium for the cultural transmission of information and a protective environment in which individual learning can occur” (Humphrey, 1976). Therefore, a group must be able to interact with each other in a protected and social environment to enhance the intelligence of its members. Humphrey then realized that the reason for creative intellect is to keep a society together.

He came to this conclusion because when he would study his own monkeys that were caged alone and compared them to his colleague’s monkeys, which were caged in groups of about eight, he noticed something strange about their behavior. Though his colleague’s monkey’s had a stark cage with no objects to play with or anything to explore, they showed a tremendous amount of intellect in the way they interacted with each other. Humphrey surmised that because primates set up their groups to be social places, they also set themselves up to be calculating beings. This is because they must be able to predict and understand the consequences of their actions and behavior, as well as calculate the conduct of other primates to gain advantages and prevent loss. In the process of doing all this, they must also be prepared for situations to change and fluctuate. Within these groups, which require much hard work from each individual, to have social skill is equivalent to having intelligence.

Understanding that social situations in complex groups are the link to intelli-
Mach. Intelligence Linking Species Together

Lauren Malone

gence, Humphrey then sought to comprehend what makes a society complex. He inferred that with an increase in generations comes a more complex society. This is because the young must be cared for and taught, and older members must do the teaching, but conflicts occur as individuals try to obtain the best resources to benefit themselves and the furtherance of their genes. Individuals must promote their genes without putting the fitness of the entire group in jeopardy. This dilemma of who takes care of and sacrifices resources for the young, who does the teaching, who resolves conflict, who causes conflict, and the always present factor of continuing ones genes creates complexity in the group. Other internal factors increase this complexity as well, such as the struggle for mates and reproductive success. When an individual is trying to continue his or her genes, their rivals are the members of their group and “If intellectual prowess is correlated with social success, and if social success means high biological fitness, then any heritable trait which increases the ability of an individual to outwit his fellows will soon spread through the gene pool”(Humphrey 1976). Humphrey believed that since humans also evolved through complex social groups, they were able to utilize certain powers of social foresight and understanding. Many studies have been performed in order to support this theory and most of them have been successful in helping to prove the point that Humphrey and many others tried to make.

Gavrilets et al. (2006) sought to understand the “Machiavellian intelligence” and the process by which intelligence is formed and spread throughout a population. They explained that during the intense social competition that humans lived in, competitors were able to use increasingly sophisticated strategies, or “Machiavellian” strategies, to gain high social and reproductive success. They used a mathematical model, which explained that genes control brain size and learning capacity, which in turn enable humans to invent and learn strategies, or memes. Competitors, in this case males, then use these strategies to gain advantage in competition for mates.

Gavrilets et al. (2006) used populations of 50 to 150 individuals. They learned that intelligence has three stages, the first of which, the dormant phase, occurs when newly invented strategies begin to become present in the population. The next phase is the cognitive explosion phase, when the memes, the learning ability, the cognitive capacity, and fitness reach a state of rampant continuous expansion with nothing keeping it in check. During this phase cognitive ability increases as intensity of competition for mates, hierarchy, and food increases. Cerebral capacity actually evolves faster during this phase, leaving room for more strategies and Machiavellian fitness to be learned. However, complexity of memes does decrease in the cognitive explosion phase. Even though complex memes help on a slow biological time scale, they are harder to learn and are therefore beaten out by the simpler memes, which are easier to learn. Additionally, there is a tendency that benefits that can be used by
the individual immediately are more desirable than something that might not help them until the future.

Finally, the last step is the saturation phase where the costs of having a larger brain stop the continuation of further cognitive ability. A large brain is costly because “brain tissue is metabolically expensive and fragile” (Gavrilets et al. 2006). This makes it clear that even though the costs of such large brains and high intellect are so high, competition in social groups is extremely important for success. However, because there is a high cost, a limit to the increase in cognitive ability does exist. Their final conclusion was that “mechanisms underlying the Machiavellian intelligence hypothesis can indeed result in the evolution of significant cognitive abilities on the time scale of 10 to 20 thousand generations”(Gavrilets et al. 2006), but that there is a limit to this development as seen in the saturation phase.

Apes are one example of a well-known and well-studied animal that demonstrates the intelligence formed by social living. In a similar study done by Simon et al. (2002), it was discovered that primate species (nonhuman) with big brains used innovation and were better apt to social learning. This suggests that social learning and innovation, through strategies that could include capitalizing on the inventions or discoveries of others or inventing new solutions to problems, contributed to the evolution of larger brain size in primates.

In the Origins of Virtue, Matt Ridley (1998) describes the social living of chimpanzees, who are similar to humans because they have a larger brain size relative to their body. In their society it is better to have a larger brain to be able to remember certain social situations, such as which individuals are allies and which are enemies, as well as the participation of the owing of favors and the holding of grudges. Also Ridley states that in chimpanzee hierarchy, the ones who will rise to the top, mate with the females, and continue their genes are the best at twisting the dynamics of the social group for their benefit. Manipulation and alliances made to gain social opportunities are key in chimp society, and big brain size is the tool with which they accomplish this.

Primates are not the only animals that show signs of complex social living however. Ridley also talks about dolphins, specifically bottlenose dolphins. With the use of an alliance between two to three males, a reluctant female is corralled, taken away from her female group, and in turn mated with by all the members of the alliance. Not only do they participate in this form of cooperation, but “second order coalitions” are formed when one such group helps another group steal a female from a third group. This cooperation and social manipulation can help explain why bottlenose dolphins have larger brains than other dolphins and whales. They need larger brains in order to be able to participate in this form of social complexity.
Other animals also have intelligence associated with social complex living. One example is birds, specifically crows and parrots. They have been shown to live in constantly variable environments as well showing a level of social complexity similar to that of apes. Though birds do not have a neocortex, the part of the brain in mammals that is involved in higher functioning in the sensory and motor functioning and thought process, this does not mean they are incapable of complex cognition. It was originally thought that birds’ cerebrums were derived solely from the vertebrate basal ganglia, which is only capable of specific behaviors such as feeding, maternal care, and sexual behavior. However, it is now understood that part of a bird’s forebrain is derived from the pallium, the same place the neocortex in a mammal is derived from. Parrots and corvids (or crows) are known to have a forebrain size very large relative to their body. Burish et al. (2004) discovered that the relative telencephalon, or forebrain, was found to be larger in species of birds that were transactional. Transactional species are those with individual recognition, transfer between groups, and social memory (Emery 2006). This larger brain is similar to that of other complex groups, like that of apes, and they similarly need the larger brain to remember individuals in social groups.

To further support the theory that the brains of birds have been adapted for cognitive processing, Emery and Clayton looked at spatial memory for pilfering strategies and found that spatial memory differed between birds that were social as opposed to birds that were territorial. They looked at pinyon and Mexican jays, which are social birds, and Clark’s nutcrackers, which are territorial. While both species of jays were able to observe other birds hiding caches of food and remember where they were located one to two days later, the Clark nutcrackers were only able to remember where their own caches were. This shows that the more socialized birds were using strategies such as spatial memory as an adaptive specialization against other birds to gain higher success in food gathering, and therefore were better capable of survival. This suggests that some forms of food gathering are forms of strategies used in competition.

Lefebvre et al. (1997, 2004) set up a comparative analysis of relative brain size and measures of behavioral complexity. To do this they documented over 2000 cases of anecdotal evidence, such as new methods birds invent for extracting certain foods, and separated them into categories defined by the different families of birds they came from. They then “correlated the frequency of anecdotes across families with either relative forebrain size or various brain components, such as nidopallium or mesopallium” (Lefebvre et al., 2004). There was a significant correlation between high innovation rate and large relative brain size for corvids, and parrots, while there was a lesser extent of correlation between non-corvid songbirds and woodpeckers. The fact that more social birds, like corvids, were able to use strategies for finding food suggests
that it was necessary for these birds to use innovation in competition with others of their species for food resources. In complex social groups, animals were faced with social-economic problems such as innovation in finding food, tool use, and being able to manipulate others to gain reproductive success. Though these aspects of their lives were challenging, they led to the evolution of their cognitive ability. These abilities include strategies, like deception, manipulation, and even new and improved ways of finding food. The fact that very different brains, such as the mammals’ neocortex and birds’ forebrain, were able to evolve in very similar ways suggests that “Machiavellian intelligence” is a convergent factor caused by the complex social living that both apes and birds lived and evolved in, and not derived from a common ancestor. Thus this proves that our human intelligence stems from the strategies we needed to learn to gain reproductive success in complex social groups.

As previously stated, “Machiavellian Intelligence” is the type of intelligence that humans have evolved to have through the complex groups we lived in and the strategies we had to learn as a consequence of that society. The results of our ancestor’s struggles for reproductive success and hierarchy can be seen in the intelligence of humans today. Humans use strategies in everything they do, from counterattacking their opponent to win in a board game, to a doctor trying to coerce a patient into telling him about their drug abuse problems. House is that kind of doctor, and is a perfect example of person who has highly benefitted from Machiavellian intelligence. Though doctors are supposed to be honest and, for the most part, stick to the basics, House is a huge exception. The use of strategies, like deception, coercion, and manipulation, has made him the successful doctor he is in the show. Just like apes rise in hierarchy and reproductive success by using strategies, House also rises in success with strategies of deception.

Since humans share the same socially complex groups as many of these animals, many scientists have inferred that this type of intelligence is not derived from a common ancestor. Instead it could be a convergent trait that derives from the strategies and manipulation needed in a complex social structure. Because our brains have evolved to be large enough to cope with complex social situations, we are able to harness the learned strategies in every day life. This in effect, is why House, or any of us for that matter, would not be the competitive, manipulative, or intelligent beings we are today without the Machiavellian intelligence learned from the complex social groups we lived in.

Lauren Malone has just completed her first year at UCLA with the submission of this paper. She recently has gone insane and decided to change her Anthropology major from a BA to a BS because she loves to torture herself with hard work. On her spare time she is as lazy as humanly possible.
sible. Her life is a musical because she is frequently heard singing any and every song that pops in her head, though only in a voice her mother could love. She enjoyed her seminar immensely and thanks her teacher for being fricken awesome.

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To Dream an Endless Dream

Ping Heh

Clomp... Clomp... Clomp. It was the witching hour in England. All was dark and silent, only the mice under the floorboards could be heard scampering around. Not a human being wandered outside; everyone was usually asleep at this time, waiting for the crack of dawn to start the next day. But shivering with fear underneath her blanket, Sophie had already caught a glimpse of the strange creature lurking outside, moving from window to window, blowing strange clouds of mischief into the rooms. Lucky for her, it was only the BFG, the Big Friendly Giant in Roald Dahl’s The BFG, out and about on his regular routine of implanting “good” dreams and catching “bad” dreams.

To dream is to experience a mental activity as waking reality despite the improbability of certain features such as time, location, people, actions, and emotions during one’s sleep (Hobson, 2000). But why do humans dream? Is it a natural process that occurs in humans only? Dreams tend to differ every night, ranging from the most vivid, outlandish possibilities to the most terrifying, sweat dripping nightmares. Maybe there really is a BFG blowing dreams into the mind’s of sleeping humans every night. Over time, dreams have continually formed in the minds of humans during sleep, and its reasons for existence have been difficult to prove. Dreams, what seems like simple by-products of the sleeping process, are actually a more complicated topic that evolves and varies in content overtime, suggesting that it might have evolutionary origins in other species as well as contributions to natural selection. Dreams have consistently reappeared as beneficial to species.
The Roots of Dreaming: Its Causal Explanations

In the real world, dreams are not known to be blown into the minds of sleeping humans through a trumpet. They are not concocted or caught by a butterfly net in an unknown world by a big, friendly giant. Dreams occur during sleep, a circadian cycle controlled by one’s biological timer to help regulate bodily functions. A circadian cycle is a naturally reoccurring habit based on a 24-hour pattern. There are two types of sleep known as REM (rapid-eye-movement) and NonREM (non-rapid-eye-movement or NREM) sleep (Hobson, 2000). REM sleep is characteristically different from NREM sleep in terms that its brain activation patterns resemble more to those during the wake state. According to Muzur (2005), REM sleep is often characterized by a mixture of saw-tooth-like waves. During NREM sleep, there are four basic stages that a person can shift in and out of. Stage 1 is often characterized as wake-like sleep with a predominance of theta waves. People are barely falling asleep and often twitch during this phase. Stage 2 portrays an increase of theta waves and sleep spindles become present, representing a phenomena within the thalamus. The 3rd and 4th stages are known as slow-wave sleep; the only difference between the two stages being the amount of delta activity present. Most people sleep during stage 4 as it is also known as deep sleep. Humans often transition from NREM to REM to NREM within their sleep. It is during these two types of sleep that a dream beings to develop in the human mind.

Sleeping and dreaming are connected in a sense that without the natural process of sleep, humans are unable to dream. Why can’t the BFG blow dreams into humans that are awake? It is during sleep that humans put down their guard, lose a sense of control over their motor senses, and escape into another realm of illusions and fantasized lives. It is during sleep that the BFG finds humans most vulnerable and open. Various parts of the brain are at work when one falls into REM or NREM sleep, whereas the human body tends to have more muscle atonia, a form of paralysis where the brain and body are disconnected. According to Hobson (2000), specific portions of the brain such as the amygdala and hypothalamus, which are associated with fear, aggression, and other emotional features, are still active during REM sleep. These constant activities in the brain cause dreams that are characterized by the following features. They include visual and motor hallucinatory perceptions. Dream imagery, including a wide range of images and events related to everyday life, can also be bizarre and change quickly. In addition, it can be delusional, making the dreamer believe that he or she is awake and lucid. Another feature is the absence of self-reflection, self control, and other forms of metacognition, though research has now shown that it might have been more common than previously thought. There is also a lack of orientation in the people, time, and place as everything is drawn into a single narrative. Emotions are more
intense, and instinctual behaviors are more prevalent in dreams. A majority of these features can be found in dreams during REM sleep while a few, if any, can be found in NREM sleep (Hobson, 2000). It is during sleep when the body is inactive and disconnected from the active mind that these common, wild characteristic dreams occur.

There is also a definite correlation between dreams and images perceived through the retina. Since brain waves detected during REM sleep are similar to those detected during the waking stage, this supports why most dreams occur during REM sleep than NREM sleep. Mizur (2005) found that 60-min naps could reduce the amount of deterioration on the projection of an image onto a part of the brain that preserved images captured by the retina. He argued that there may have been an indirect relationship between the amount of daily perception and sleep through the form of dreams. It was discovered that congenitally blind humans had no visual imagery in their dreams, while those who later became blind in their lives, still had some visual imagery present even though it slowly decreased overtime. In another study, Berger et al. (1962) studied eight men, blinded at different ages, and reached the same conclusions. Three of the men with life-long blindness had no conception of visual imagery. Two of the men whom became blind later on in their lives for at least 30 years or more stated that they had lost the ability to picture things and had no visual imagery in their dreams. Furthermore, these five men lacked traces of REM sleep whereas the other three men whom became blind later on for 15 years or less had traces of REM sleep, but differed from those with normal vision. Not only that, but only one of the last three men had saw-tooth-like waves, indicating that the amount of eye movement could also be provoked by the visual dream content. Berger et al. (1962) concludes that there most likely is a connection between the images perceived through the eyes and the visual content of dreams through his study.

The Puberty of Dreams: Its Developmental Explanations

Throughout life, the content of dreams have changed and developed. By looking at various dream reports, dreams written down right after being awakened, researchers have been able to detect a shift in content focus based on gender and humans age, as well as explain the occasional encounter with bizarre dreams. The focus is mainly on how dream content changes over time.

Most people indicate that they dream more often during REM sleep than NREM sleep due to the varying dream reports found after subjects were
awaken during the two types of sleep. Dreams reported during REM sleep are described as more perceptually vivid, more animated, more emotionally influenced, and less related to the waking life (Hobson, 2000). On the other hand, dreams reported during NREM sleep are known to be shorter, less vivid, and more thought-like, representing current concerns, compared to those reported during REM sleep (Muzur, 2005). This is due to the possibility that dreams during NREM occur in the second stage of sleep, so the dreams could actually have been hypnagogic hallucinations, hallucinations occurring at the boundaries between the sleep and wake phases. Muzur (2005) suggests that dreams occur during REM sleep because that is when dreams are fixated into the memory instead of being processed for elimination. Poor reflections of dreams can be due to hypnagogic hallucinations and traces eliminated from memory (Hobson, 2000).

Humans, when asked to report their dreams upon being awaken, often describe having bizarre, illusory, and sometimes nightmarish dreams that are unexplainable. This can be due to the fading information and images in the brain or the deactivation of the dorsolateral pre-frontal cortex (Muzur, 2005). The dorsolateral pre-frontal cortex is responsible for motor movement, organization, and regulation. During REM sleep, the frontal, orbito frontal, and cingulate cortex are active. Muzur (2005) studies how certain parts of the pre-frontal cortex in the brain become inactive so that during sleep, those parts are not refreshed and contain fading memory. Muzur states that because human perception of outside stimuli and the habitual actions of speech and movements becomes inaccessible during sleep, the dreams demonstrating strange scenes are the outcome. Nevertheless, Muzur does that conclude that though most reported dreams are outlandish and disorganized, there can be acceptable dreams that are not bizarre.

Only through the analysis of dream reports have researchers also been able to find a correlation between the dream content and the age and gender of humans. A study conducted by Avila-White (1999) found that the dream content of 12-13 year olds was somewhat similar to young adults who reported their dreams in a previous study. In this study, participants were asked to write down the last dream they remembered having, whether it was from the night before, a few nights ago, or last week. Most dreams took 20-25 minutes on average to write, and the girls often had longer reports. These dream reports differed mostly between the amount of friendliness and aggression present, which was also a similar finding in the study on young adults. Boys usually had more outdoor, antisocial, aggressive dreams, whereas the girls had more friendly, social dreams. Avila-White’s study, however, concludes that more experiments with other varying demographic factors should be conducted in order to obtain more accurate conclusions to allow greater generalizations about similar dream contents amongst various people at different ages. Cross-
sectional studies on 14-18 year olds should also be conducted to fill in the gap between the two age groups to grasp a better understanding of the dream content in men and women throughout maturity.

The Transformation of Dreams: Its Evolutionary and Adaptive Explanations

But do dreams really have a clear purpose in life? When generally thinking about what, when, and where a dream occurs, one tends to think about the broad details without going in depth with its other functions. It seems as if dreams are only false adventures that humans are allowed to experience while their body replenishes itself. The BFG makes dreams sound relaxing and entertaining in his world. Why have dreams been persistent throughout the reproduction of humans and if any, other species as well? Natural selection has clearly chosen a reasonable path for dreams to continuously evolve through species over time, giving it useful functions, and maintaining alertness and caution while losing a sense of connection to body motion.

Dreams have been thought of as potential problem-solvers. In the story, Dahl had used the concept of dreams as forming a possible solution to a real-life problem by making the BFG implant a dream into the Queen as a solution to prevent the other ghastly giants from overthrowing her. Researchers suggest that dreams may have continually evolved with human nature due to its possibility in resolving real-life problems. Barrett (1993) concluded that most of the accounts of problem solving dreams were characterized as REM-like. In the study, subjects were asked to explore a personal, objective, or academic problem. They would read over their specific problem before going to bed each night, and then record their dreams in a journal to see if there were any solutions. About half felt they had dreams related to their problem, and about 70% believed that there was a solution found in their dreams. Barrett (1993) claims that the dreams seemed to help the dreamers when they were stuck in waking decisions, but did not necessarily represent different facilitators in learning because his study did not evaluate the quality of the solutions. After analyzing dream reports, Barrett (1993) had also stated that most of the dreams seemed to have addressed the problems instead of fully resolving it. The dreamer may have overlooked the solution as well since analyzing one’s own dream required self-interpretation. However, many other researchers argue against Barrett stating that the dream reports cannot be accurate evidence since problem-solving takes place in the waking, active world. They argue that dreams are unique and vague; they could be interpreted to seemingly resolve or address an issue, but really does not. As a result, Barrett (1993)
concluded that the dreams could feel like solutions to problems as they pro-
vided personal satisfaction in possibly containing solutions to the dreamer.

Dreams could also be used to help improve spatial task learning. By training
subjects on a virtual, navigational maze task and then having a group nap
afterwards in comparison to a group that stayed awake, Wamsley et al. (2010)
was able to argue that dream experiences did reflect the memory process and
help improve future performance. Four participants who reported dreams
about the task during their nap showed the best improvements in the group
whereas those whom thought about the task while wide awake showed little
improvement. Those who dreamed about the maze had initially performed
poorly in the beginning while learning the maze, but then showed much im-
provement afterwards. The authors suggest that the postsleep improvement
was due to the reactivation of the specific memories in the brain during sleep,
referring to the dream content of the subject.

Dreams have evolved through not only human life, but also other species such
as a cat or rabbit (Revonsuo, 2000). There must be a definite reason for dreams
to occur as it traces back to ancient times. Revonsuo (2000) states that dreams
are merely a by-product of sleep, not selected for or against during the process
of natural selection because they are solely created by the dreamer. Since sleep
is needed to restore the neurochemical balance in the brain and dreams occur
during sleep, dreams are only a by-product (Revonsuo, 2000). Although it
cannot be verified, other mammals are suggested to have dreams as well, due
to the complex behavior observed during REM sleep (Revonsuo, 2000). For
example, Revonsuo (2000) uses a cat searching for prey as a typical behavior
displayed during sleep. This suggests that animals seem to focus on past
images and experiences like humans. Since sleep is necessary in replenishing
the body with energy, dreaming acts as a complimentary feature.

In addition, others also hypothesize that dreaming is an endogenous percep-
tual activation that is used to awaken the dreamer from sleep. Based on Fred-
eric Snyder’s theory of dreaming, Revonsuo (2000) has also hypothesized that
the essence of dreaming in other mammals suggests that the brain prepares
the creature for a possible attack since it is most vulnerable during sleep. Sny-
der’s theory of dreaming proposes that sleep is regarded as an adaptive mode
for species to hide (Revonsuo, 2000). As sleep is used to restore metabolic
energy and reduce resource use to as low cost as possible, these animals need
a built-in physiological mechanism to periodically awaken them from sleep to
scan for danger. Mammals are occasionally awaken after REM periods, where
the brain prepares for a possible fight or flight (Revonsuo, 2000). This is dis-
played with threat dreams or dreams that allow mammals to position itself in
a ready-to-attack stance. Important information for survival is thought to be
accessed during REM sleep and integrated with past experiences to provide
a strategy for future behavior (Revonsuo, 2000). It is said that the dreaming brain in some mammals rehearse specific survival skills as the part of the brain associated to inducing theta waves responds to the changing environment in reality. The dream content activates the central nervous system and anticipates a possible encounter in real-life, helping species survive in the real world as a possible adaptive function similar to humans.

By researching the dream content of hunters and gatherers, Revonsuo (2000) predicts that threatening events are overrepresented, whereas nonthreatening, peaceful events are underrepresented in dreams. These nontreathening dreams consist of various daily activities: “Went to the river and saw birds,” “Went to the garden,” or “Went to the field to get corn” (Revonsuo, 2000). Only 20% of the 276 dreams reported by the Mehinaku hunter-gatherer group displayed peaceful dreams while about 60% displayed threatening situations. The waking lives of humans, even in ancestral times, are not focused on being cautiously aware of a possible threat to occur. These dream samples help show that threat simulation is frequent and generates in the form of dreams as a useful trait for reproductive success.

Furthermore, Revonsuo (2000) compares dreams as a threat-simulation mechanism to other biological defense mechanisms such as the immune system. He argues that the immune system is created to help defend the body against microscopic pathogens, similar to dreams developing in sleep to help protect humans from macroscopic enemies and events surrounding them. When a pathogen is detected, the body sends out a response and then switches off as its protection is no longer needed. Certain parts of the immune system sometimes also remembers the pathogen so that future invasions are prevented at a quicker pace. In the real world, after a threatening encounter and a threat-simulation is produced in dreams, the dreamer will be better prepared to deal with similar threats in the future (Revonsuo, 2000). In addition, when all pathogens are removed, the immune system switches off and returns to a resting state. With dreams, the threat-simulation is also returned to a resting state when no real threats are proposed, and the dream content becomes less troubled and threatening. The production of dreams functions similarly to that of the human immune system, showing analogous design features between two different human functions.

Conclusion

As the BGF quietly strolls through the city and returns back into the darkness to catch more floating dreams with his net, the sleeping humans lightly stir in their beds. Each human is either fantasizing a bizarre dream, revisi-
To Dream an Endless Dream

Ping Heh

Dreams have clearly come to be a propitious behavior to human beings. Its existence in humans as a by-product of sleep allows humans to visually perceive outlandish possibilities and various other situations as the dream content continuously changes over time. The functions of dreams as potential problem solvers and occasional reminders to awaken from sleep for possible danger has allowed natural selection to favor this behavior and adapt to human life. To dream is no longer to experience a mental activity as waking reality despite the improbability of certain features such as time, location, people, actions, and emotions during one’s sleep, but also a subtle aide to human existence through the above mentioned explanations.

Ping Heh loves to travel the world in her imagination. She is often found staring off into outer space, notably day dreaming about her later escapades. When spoken to, she can be quite the serious fellow, with a blunt attitude and stern look. But not to worry, once talking, Ping can also be quite friendly, though weird and awkward.

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Part III

Emotions and Decision Making
Procrastination: The College Student’s Eternal Bedfellow

Jake Greenberg

Despite knowing for almost two months about the research assignment due at the end of the academic quarter, I have continued to neglect and delay writing until shortly before deadline. Procrastination is as familiar to the college student as ramen noodles, and in fact there may be a positive correlation between postponing work and consuming microwavable food, but that is for another assignment. Procrastination is a behavior that certainly challenges Descartes’ idea of a rational human mind. We choose to procrastinate, knowing that we will be uncomfortable in the future, a relatively succinct display of valuing the proximate moment over the ultimate result. Procrastination is an almost universally objectionable (lack of) action: “We must be diligent today, to wait until tomorrow is too late. Death comes unexpectedly; how can we bargain with it?” says the Buddha; “Idleness and lack of occupation are dragged towards evil,” writes Hippocrates; and “God has promised forgiveness to your repentance, but not tomorrow for your procrastination,” quips St. Augustine.

Though procrastination has been universally denounced by almost every culture, very few have attempted to explain the causes of the phenomenon. Biologists and behavioral psychologists have researched procrastination thoroughly, but school administrators and professors have shown recent interest in the topic because college students’ tendencies to favor the apparently illogical avoidance of immediate exertion over incremental time management tend to be greater than older adults (Solomon and Rothblum, 1984). However, while some of the intuitive repercussions of procrastination are repeatedly proven accurate, such as higher stress (Ferrari, 1997) and lower quality of work (Tice and Baumeister, 1997), others have not withstood scientific inquiry, such as procrastination being an unintentional phenomenon caused by lack
of planning (Chun Chu and Choi, 2005). Scientists now view procrastination as a behavior among many (or most) people, but motivated by a variety of rationales, usually categorized as passive or active types (Chun Chu and Choi, 2005), that depend largely upon upbringing (Ferrari, 1997) and personal choices (Ferrari and Harriot, 1997).

Though procrastination is a human behavior, it cannot be tidily labeled “the effect” linked to a single evolutionary “cause.” Studies have shown that procrastination is probably a negative repercussion of temporal inconsistency, which allows human to place more priority in moments closer to the present by being able to conceptualize the present in more concrete terms (McCrea et al, 2008). Today, especially on college campuses where students are pressured to participate in sports, clubs, and volunteer organizations while maintaining an impeccable grade point average, procrastination may be more common than ever because time management becomes so much more difficult. Using self-report surveys, Solomon and Rothblum (1984) found that 95% of undergraduates report procrastinating in one way or another. In the same studies, they discovered that, compared with students from other countries, Americans were 46% more likely than students in other countries to procrastinate on research papers, 28% on studying for an exam, and 30% on weekly writing assignments. When completing a task cannot always fit neatly into a timeframe that is constantly changing and being crammed with extracurricular activities, the temptation to procrastinate often becomes the temporary panacea for a busy student. The purpose of this paper is to define in more nuanced terminology procrastination and those who practice the slothful sin, and describe the debate surrounding the causes of procrastination, including psychological, developmental, and environmental factors. Ultimately, I will show that your fifth grade teacher may have been telling you the truth when she said putting that assignment off until the “night before” will not yield your best results. However, “best results” is itself subjective terminology. Studies show that the grade you receive may not necessarily suffer if you procrastinate. The “best results” your teacher was talking about is therefore most clearly understood as relative to your potential, not necessarily the teacher’s expectation. While you are almost certain to turn in work that is inferior to your potential if you had not procrastinated, there is little evidence to show higher levels of procrastination and grade point average are negatively correlated (Tice and Baumeister, 1997).

Procrastination is largely a human behavior. Though gorillas and chimpanzees have been recorded loafing and playing while more important tasks remain incomplete (e.g. nest building and food gathering for young), the amount of time between recognizing an obstacle and choosing to engage it is largest in humans, mostly because the human ability to plan reaches farther than any other animal (Heyes, 1998). In experiments, however, though chimpanzees
were occasionally found to be playing, almost 80% of their total time was spent either gathering food, socializing in constructive ways such as grooming or forging alliances with other chimps, or caring for young. Humans, studies demonstrate, can spend much greater amounts of their time dawdling, and socializing while work in the form of term papers and studying is still looming (as much as 70% of waking hours in studies conducted by Amabile et al, 1976). If procrastination is not unique among humans, it is certainly perfected by them.

This correlation between procrastination and brain size is probably no coincidence. As an animal that prides itself on its adherence to logic, the average human often chooses the seemingly illogical decision to push a burdensome task to a future date or time, with full knowledge that the task will remain just as burdensome at that future time, if not more so because of the shorter time restraint (Tice and Baumeister, 1997). This may be explained by the tendency among humans to place closer moments in time in more concrete specifications and those moments further away in less defined cognitive terms. For instance, in studies on which Richard Thaler elaborated, when given the choice between receiving one apple today or two apples tomorrow, most people choose one apple today. However, when given the choice between one apple in one year, or two apples in one year plus one day, everyone who participated in the study chose the second option. Thaler expanded this experiment using gains or losses in money to demonstrate that if subjects choose Option A today, they should choose Option A in the future, but that is not always the case (Thaler, 1981). This is what Thaler calls “dynamic inconsistency.”

Dynamic inconsistency is probably the result of evolution favoring behavior that ensures survival during the proximate moment over the ultimate. Dawkins (1995) defines optimality as split between favoring the long term ability to mate and the short term ability to survive. It does not make sense, Dawkins asserts, for an animal to be perfectly optimized at gathering food if it is so intent on gathering food if it does not breed. Similarly, if it is optimized to breed that it cannot gather food, it too cannot survive. To some degree, procrastination certainly makes sense. If every task was given time throughout life, people would not be able to prioritize. Children would plan their funerals at the same time they studied for a college final approaching in a mere ten years. Procrastination thus is a deleterious effect of humans favoring their proximate optimality over their ultimate optimality.

Procrastination may be a result of a form of dynamic inconsistency. A similar theory that does away with the cause and effect structure of dynamic inconsistency is “construal-level theory.” This theory correlates time and higher-level construals instead of the causal relationship in dynamic inconsistency. Instead of manipulating the time variable, McCrea et al attempted to first present
terms in more concrete details and see if this affected people’s tendencies to procrastinate. Scientists set up a series of options in a survey that gave students the choice between a vague activity (e.g. “contribute to the scientific feedback process”) and a more concrete way of phrasing it (e.g. “write a page of comments”). The students were then told to turn in the results by the end of the week, and another survey was taken to determine how much procrastinating the students had done before actually getting to the assignment. Students were almost twice as likely to commit time to a more concrete activity than a vague activity. The researchers’ hypothesis that students would procrastinate less if given in more definite terms what was expected of them was proven correct (McCrea et al, 2008).

Procrastination may therefore stem from an attempt to, not a lack of ability to, monitor one’s time. Researchers are currently reevaluating the strict definition of procrastination, often labeled as simply a passive means of skirting responsibility at the moment or an inability to manage time efficiently. Scientists are able to make more accurate predictions about mental health, rationale, and performance by dividing procrastinators from non-procrastinators, and then further dividing “procrastinators” into “passive” and “active” categories (Chun Chu and Choi, 2005). A passive procrastinator fits the classic idea of the typical procrastinator; she unintentionally puts off the task because of several reasons explained later on, experiences feelings of doubt and guilt, wishes she had not procrastinated to begin with, and often turns in work that is below her capabilities if she had not waited. Passive procrastinators are likely to give up on an assignment or come unprepared to class. An active procrastinator, however, consciously decides to put off working on a task and focus on other matters. He usually enjoys working closer to the deadline and under pressure because it offers a challenge, and he often turns in work that is adequate or even well done, if not as polished as the non-procrastinator. Therefore, according to Chun Chu and Choi, active and passive procrastinators differ on cognitive (actively deciding to put off a task), affective (preferring to work on a task as the deadline is nearing), and behavioral (choosing to act efficiently when the time does arrive to work) levels.

Self-efficacy, one’s confidence in one’s own capability to complete a task, is a major difference between active and passive procrastinators. Dipboye and Phillips hypothesized that non-procrastinators and active procrastinators would report higher levels of self-efficacy than passive procrastinators. By testing a group of over 200 undergraduates at a large university with a survey at the end of a large research assignment that spanned the entire academic semester, their predictions were supported. Passive procrastinators were 40% more likely to report higher levels of stress, depression, and feelings of inability to finish the task than active procrastinators or non-procrastinators. Indeed, non-procrastinators and active procrastinators showed insignificant
variation between these categories, lending evidence to the idea that non-procrastinators and active procrastinators make a similar cognitive decision regarding their time. Both feel in control of their schedules, the only difference cognitively is how they allot the time (Dipboye and Phillips, 1990).

Critics of the above study, however, point that students’ levels of stress were taken only after the research assignment was turned in. Right after rushing to finish an assignment, it is to be expected that procrastinators, both active and passive, would feel more stressed than the non-procrastinator; they just completed significantly more work. However, this may be misleading because the time that the non-procrastinator was using throughout the semester working on the assignment, the procrastinator may have been out enjoying himself. The procrastinator’s discomfort throughout the brief time working on the assignment may have actually been less than the drawn out discomfort felt by the non-procrastinator. The procrastinator’s suffering is merely concentrated (Tice and Baumeister, 1997). Tice and Baumeister tested this hypothesis by having 60 university students who were assigned a semester-long research project fill out a survey that tested stress levels and completion levels. On a 7-point scale (1=no stress, 7=most stress), those who had done little or no work on the project at the beginning of the semester did report slightly less stress (mean 1.4) than those who had begun work on the project (mean 2.8). However, as the semester progressed, procrastinators reported a significantly higher level of stress (mean 8.2) than non-procrastinators (mean 5.2; Tice and Baumeister, 1997). After finding the integral of both graphs that charted stress levels over time, those who procrastinated did experience a “total stress” somewhat higher than non-procrastinators (48.40). This study, however, did not divide procrastinators into “active” and “passive” categories. Similar studies using this division show very little “total stress” variance among non-procrastinators and active procrastinators (Chun Chu and Choi, 2005).

College students are particularly prone to procrastinate for several reasons. Studies show that regarding the nature-versus-nurture debate that often rages over a particular behavior, procrastination is largely a product of one’s early experiences and one’s environment. In college, one’s behavior is largely independent from one’s parents for the first time, thus early experiences’ effects can be gauged well on a college environment. Also, the college campus is an especially diverse atmosphere than can provide a variety of atmospheres. A study conducted by Ferrari et al. aimed to determine the extent chronic procrastination among college females was affected by the home environment in which they grew up. The college undergraduates were divided into three groups based on the classic three categories of parenting: authoritarian (involving strict, uncompromising parenting with little warmth), authoritative (strict, but willing to compromise and offering warmth), and permissive (not
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Jake Greenberg

giving any structure to the child’s upbringing). After filling out surveys, the results showed that, surprisingly, it was the students who were raised with an authoritarian parent that were most prone to procrastinate. Next came those raised with permissive parents, then finally the authoritative upbringing. The authors of the study predicted from the results that procrastination from children of authoritarians stems from the child’s attempt to strike back at her parents’ rigidity. Interestingly, the correlation only applies to the female students’ fathers; mothers seem to have very little correlation with their daughters’ procrastination. The authors of the article also point out that the people who reported higher levels of procrastination also admitted to more tendencies to suppress anger (almost three times more than non-procrastinators), thus they conclude procrastination is a self-destructive tendency resulting from the strictness of parenting one experienced the early stages of life (Ferrari et al, 1997).

Environmental factors also play a role in determining one’s propensity to procrastinate. The typical lifestyle of a college student is conducive to putting off assignments. In studies conducted by Ferrari et al, students who were both admittedly procrastinators and non-procrastinators at a university were asked if they felt more active in the morning or in the evening. They were then given a diary to record throughout several weeks when they did most of their work on an assignment that was to be turned in at the end of the period. Overwhelmingly, procrastinators described themselves as “night people,” while the non-procrastinators remained evenly divided. However, while the non-procrastinators were also equally divided in their entries regarding when they completed most of their academic work, the majority of procrastinators did most of their work in the daytime, until the very end of the study when the deadline was approaching. These results point to people who did other activities during their prime hours. Clearly, with parties, clubs, and extracurriculars being pushed further into the later hours, procrastination among undergraduates will also become more common, the researchers deduced (Ferrari et al, 1997).

What students probably want to know most from this paper is if there is some strategy or way of procrastinating that ultimately yields good results. After examining causes and justifications, and dividing procrastinators into active and passive sorts, and calculating stress levels, the question remains: do procrastinators generally score equally well on tests and papers as their non-procrastinating peers and are there advantages to procrastinating? Though Chun Chu and Choi’s experiments using students at a large university supported the idea of passive and active procrastinators, other studies have shown that those who procrastinate generally turn in inferior work to those who do not, regardless of how they intend or prefer to use their time. The time before the due date students began writing an English paper, and the grade they re-
ceived on the final draft were roughly positively correlated in one study using 200 undergraduates from a large university (Fritzsche et al, 2002). However, the study admits that only 22% of the papers graded were released for evaluation in the experiment. Also, a variable that largely affected the students’ final grades was their decision to receive feedback from a teaching assistant or the professor. Those who revised their papers, regardless of procrastinating or not, received better grades (mean 84.2% on final grade) than those who simply turned in their first drafts (mean 74%). Therefore, the time when completing the English paper might have had less to do with the final grade than the time put in for revising. At what point the revisions occurred relative to the final draft being due is unstated in the study.

As for if there are certain advantages in procrastinating, a few legitimate reasons have been given by researchers. In a study conducted by Macan et al, procrastinators were found to be in better shape than non-procrastinators (Macan et al, 1990). However, this study is not supported by further studies, which show people who practice more moderate levels of time management are more likely to maintain a healthy diet and exercise more often than those constantly rushing to complete a task (Weinsier et al, 1981). A more logical explanation for college students procrastinating is that if an assignment is due at the end of the semester that reflects on everything learned in the course, it makes sense to put off writing or beginning the assignment until all the information has been given out.

As the hours rush by and I require a conclusion to end this research paper, I am comforted by certain facts that I discovered while writing. I attempt to convince myself that I am an active procrastinator who works well under deadline as I take solace in the fact that studies are inconclusive regarding final grades and levels of procrastination. I blame my parents’ permissive parenting and an overactive college nightlife. Despite all of this self-comforting, however, procrastination does inevitably lead to an unpleasant experience, and it only exacerbates the situation because we know as we procrastinate how terrible we will feel when it actually comes time to buckle down and commit. As I type these words, saying aloud my all-too-familiar mantra “I will not procrastinate again,” I know in the back of my mind that of course I will. The proximate moment is always so much more tempting than the vague future. Procrastination is the college student’s eternal bedfellow, and like many companions, perhaps we should accept that it won’t be leaving any time soon and just find a way to get comfortable.

Jake Greenberg is an Arabic/History student with minors in Jewish studies and global studies. He is a frequent procrastinator and enjoys sailing for the UCLA Bruins and writing for the Daily Bruin to put off writing research papers and studying for finals. He continues to tell himself he...
will not put himself in a situation that requires writing up until the last
minute. He has promised himself he will make an effort to not procrasti-
nate again, though he has not gotten around to doing it quite yet.

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Jake Greenberg


Laughter and Humor from a Scientific Perspective

MELISSA ALDECOA

Introduction

It is a Thursday night at 9 o’clock; it’s time for your favorite sitcom, The Office. Jim Halpert, the beloved prankster of the show, says “you really think you can go all day long?” Michael Scott, the jokester boss responds, “that’s what she said.” Scott’s quick line receives chuckles from the other characters in the show and from you and your family watching the show in your living room. While eating with your friends on the weekend, your buddy tells an embarrassing anecdote about a mishap at work; he got into an elevator and upon thinking he was alone, he let out a smelly fart. Soon, his fellow coworkers enter the elevator and are appalled by the sickly odor wafting in the air. Their faces say disgust and concern. After your friend finishes telling his story, everyone is doubled over in laughter. At the UCLA/USC football game, some Trojan wide receiver catches the ball and is heading toward the end zone to score a touchdown. The red and gold think they have it in the bag until the cocky wide receiver slips on a mud patch and fumbles the ball to a mighty Bruin nearby. The Bruins turn around and head to score as the fallen Trojan gets up with a look of embarrassment on his face; the crowd begins to giggle at his clumsy mistake.

Humor and laughter are all around people; they are a common occurrence in the every day lives of humans. From displays of entertainment to just being around other people to simple human error, laughter and humor are constantly displayed among humans. Although this behavior is something
people engage in on a daily basis, few know the reason for why these traits have been favored by natural selection. There are many functional level explanations that have been developed to explain laughter; functional level theories say why and for what use laughter has come to be a common part of human life. This paper discusses a functional level theory about the evolution of laughter, two functional level theories about the evolution of humor and provides a phylogenetic explanation for this behavior in relation to other primates. The functional level explanation as to why laughter developed is “the false alarm theory” (Ramachandran, 1998); it says laughter came about as a reaction to a seemingly threatening situation, but after a little bit the being who thought he was threatened realized the situation was safe and releases that built up tension in the form of laughter. The first functional level explanation for humor says humor may have evolved as a behavior in humans for sexual selection; laughter gives an advantage to an animal when being selected for as a potential mate. The second functional level theory to explain humor came about as a way for people to gauge how much interest a human has in another one. Finally, this paper looks at a phylogenetic explanation of the evolution of laughter; laughter seems to have a history beyond that of humans.

The Functional Level Explanation of Human Laughter “The False Alarm Theory”

“The false alarm theory” essentially proposes laughter developed to inform other primates that the situation at hand is non-threatening or not dangerous. Laughter follows a “build-up of expectation”, a situation in which one expects a certain thing to happen, with an abrupt twist (Ramachandran, 1997); however, the twist must inform the other primates that the situation is safe. The boisterous sound that follows, laughter, is then used to notify others that the current circumstance is safe. This general idea can be applied to cases which elicit laughter. For example, when a person, Jane, is being tickled, a gesture that forces physical interaction of one person over another, initially Jane may feel threatened. However, once Jane realizes the tickler is just acting in a playful manner, the person being tickled begins to laugh. Jane may initially come to expect the tickler is trying to act in a harmful way; however, once it is understood that the situation is playful the built up tension of Jane is released through laughter and understood as a sign of a non-threatening situation. In addition, laughter produced because of slap stick humor can also be explained by the false alarm theory. For example, when one, Jane, witnesses another person, Bob, slip and fall on a banana peel (Ramachandran, 1997) Jane watching feels worry and anxiety because she is unsure if Bob is hurt. The expected outcome to Bob is injury. If Bob gets up and keeps go-
ing, Jane most likely would laugh. This laughter generated by Jane occurs because the expected outcome was changed and Bob is not in a threatening situation. Had Bob actually been hurt, Jane would not have laughed because her expectations would have been fulfilled and Bob would have actually been in danger. “The false alarm theory” of laughter is one possible explanation for the reason humans partake in this behavior.

“The false alarm theory” is further supported by the general idea that when situations arise that display “nonserious social incongruity”, when something occurs in a social situation when there is an abrupt, “unexpected change in events”, laughter is often the result (Gervais et al, 2005). The laughter generated from these types of circumstances is stimulus driven and has emotions behind it, meaning something has prompted the laughter and caused feelings to arise; this is known as duchenne laughter (Gervais et al, 2005). The earlier example of Bob slipping on a banana peel and falling, but remaining unharmed is a form of nonserious social incongruity. The laughter that followed from Jane, who was watching the situation, was stimulus driven; hence, it is duchenne laughter. Moreover, studies have found that human infants will cry and laugh in the same situations. The infants who were studied were given some kind of stimuli, such as peek-a-boo or tickling. The studied infant would laugh if he/she felt safe or in a playful situation, one in which the situation was light hearted and no threat was perceived; on the other hand, with lesser degrees of safety or playfulness, the infant would often cry. This experiment is reflective of the false alarm theory. When a baby finds itself in a situation which could be threatening, but finds it is actually safe or playful, he/she laughs. The built-up tension felt by the baby is released through laughter and is used as a sign of feeling non-threatened.

The Functional Level Explanation of Humor: Sexual Selection

One of the functional level explanation proposes humor evolved as a trait that enhances sexual selection among potential mates (Li et al, 2009). In this sense, the concept of humor is the understanding of an amusing situation which is often followed by laughter. A recent study was done that looked at the degree of humor one finds in a person depending on how attracted one is to that other person; it is believed that when a person is attracted to another person, that person interested in the attractive other will find the attractive other to be more funny compared to the same humor from an unattractive person. Li et al (2009) speculate that humor can give insight into a potential mate’s “underlying intelligence and genetic quality”. In human courtships,
usually the male competes for the attention of the female; following this idea, women are more interested in men who can make them laugh, while men are more interested in women who can appreciate a good sense of humor (Li et al, 2009).

A study was conducted in survey form which incorporated specific questions about the attraction of certain potential mates and already existing mates. The researchers set up four different situations and asked the participants four questions in each situation. The four situations were: meeting someone new and feeling romantically attracted to that person, meeting someone new and not feeling romantically attracted to that person, interacting in a long-term relationship with your partner and feeling satisfied in the relationship, and interacting in a long-term relationship with your partner and feeling unsatisfied in the relationship. In each situation, participants were asked four questions and were to answer on a nine point scale, with one being “extremely unlikely” and nine being “extremely likely” (Li et al, 2009). The four questions were as follows:

1. “How likely would you be to initiate some general conversation?”
2. “How likely would you be to initiate some humor?”
3. “If the other person initiated humor, how likely would you laugh?”
4. “If the other person initiated humor, how likely would you consider the other person to be funny?”

From these scenarios and questions, the survey looked at three specific variables: “domain (courtship, long-term relationship), interest (attracted/satisfied, not attracted/satisfied), and interaction type (conversation, humor)” (Li et al, 2009). The participants in this study were undergraduate students from a large southwestern university. From the scenarios, the researchers found for one to initiate humor there was a great dependence on attraction, more than just normal conversation. When a person was more attracted to another person, he was more likely to initiate humor; on that note, when one found the other person to be unattractive, one was less likely to initiate humor. In terms of both courtships and relationships, men and women were more inclined to pursue humor when there was a romantic attraction to a possible mate or satisfaction with one’s romantic partner. From this study, it seems humor has become such a big part of human life because with it, there is more potential for getting a possible mate, and therefore, there is a greater opportunity for reproduction. On a functional level, this behavior serves to increase the opportunities for reproduction.
The Functional Level Explanation of Humor: Interest Indication Model

As humor may be a trait used in sexual selection, it further may also be used as a way for people to establish or maintain a relationship and as device to understand the interest a person has in having any type of relationship. Among the scientific world, this theory is known as the interest indication model. Humor can be used to gauge how much interest a person has in another person by the responsiveness of that other person. In addition, humor may be used to understand a situation, rather than asking blatant questions or it may be used when there is a lack of information for one to evaluate a situation by.

A study was conducted that had undergraduate participants in an introductory psychology course watch a video of a round of speed dating. It focused on men initiating humor and women’s favorable or unfavorable responses to the initiated humor. In the displayed film, scripts were written by an actual film industry writer; each script had a man walk over to a woman, introduce himself, and sit down across from her. However, there were four different scripts; one had a male attempt at humor and a positive female response, the next had a male attempt at humor and a flat female response, the third had no male attempt at humor and a positive female response, and the final had no male attempt at humor and a flat female response. The scripts were pre-tested and rated on the funniness of the males (one as not funny at all and seven as very funny); the two humorous scripts were approximately the same in funniness (average funniness rating of 5.36 and 5.07) and the average non-humorous scripts were approximately the same in funniness (average funniness rating of 3.36 and 3.21). Four students were hired as actors to play the male-female speed dating pairs. Male actors played their roles with the same enthusiasm; female actors played their roles with the same emotion for the two positive responses and the same emotion for the two flat responses (Gervais et al, 2005). After the participants watched the simulated speed dating round, they answered questions about: whether the male initiated humor, whether the male seemed to be interested in the female, whether the male attracted to the female, whether the male would like to see the female again, whether the male was being emotionally expressiveness, and whether the male initiated conversation. These same ideas were asked about the female as well. These questions were measured on a one to seven scale with one being strongly disagree and seven being strongly agree. In the humor initiated situations, the perceived average rating of displaying more attraction and interest was 5.69 and in the non-humor initiated situation, just when general conversation was exercised, the perceived average rating of displaying greater attraction and interest was 5.32. In addition, when the females gave a positive response compared to a flat response in humorous situations, participants thought it
was more likely that the speed daters would want to see each other again (the positive response gave an average score of 5.71 and the flat response gave an average of 2.52). In short, the researchers found when males initiated humor, they seemed to be more attracted to the females and more interested in them, compared to when males just initiated general conversation. When females responded positively, participants believed they were more attracted to the males and had a greater interest in seeing them again. It should be noted that participant perceived interest and attraction for males was higher in interactions with humor. The study also concluded that males and females were more interested in seeing each other again if humor was initiated and if the response was positive. This study found that the initiation of humor was a strong indicator of interest and potential for a relationship. From this research, it appears that humor has come to be a social signal for humans to gauge the level of interest one person has in another. As humans started to become increasing social animals, humor may have evolved to understand relationships among people.

**The Phylogenetic Explanation of Laughter and Humor**

A phylogenetic stand point looks at the evolutionary origins of a behavior; from a phylogenetic perspective, laughter is a behavior descended from other primates. Laughter is in fact a “cross-species phenomenon” (Ross et al, 2009). When nonhuman primates play together, they often display a “play face expression” or a “relaxed, open-mouth display” (Weisfeld, 1993). The expression humans make when they laugh is similar; humans open their mouths in a relaxed, playful way to let out laughter. Moreover, other studies conducted have compared the sound of breathing exerted when humans laugh and when primates are at play. Chimpanzees make a “pant-pant” laughing noise while humans make the familiar “ha-ha” sound. These laughter-like vocalizations chimpanzees and other apes make are produced when these primates are at play or when they are tickling each other. Laughter like sounds are not just exclusive to chimpanzees and humans, but similar vocalizations are also found in Old World primates such as: gorillas, orangutans, entellus langurs, baboons, and rhesus macaques (Weisfeld, 1993).

Studies done on human infants also give way to the origins of laughter. For humans, laughter is the first form of vocalization for an infant; laughter is exercised before language in human infants (Weisfeld, 1993). From an evolutionary perspective, language evolved two million years ago during the time of *Homo habilis*, which was four and a half million years after the emergence
of laughter. Studies done examining human infants and chimpanzee infants have found that the emergence of laughter like vocalizations occur around the same time in their developments. Human laughter in infants is caused when an infant sees some basic stimulant in a playful, safe way. On the other hand, if the infant views the stimulant in a threatening light, the infant will cry. Similarly, primates, such as apes, will engage in behavior that can either be construed as playful or aggressive. When the behavior is playful, primates make a “play panting” noise and “play face” with an open mouth (Gervais et al, 2005).

However, there are some differences between human laughter and primate laughter, which can be traced back to the emergence of bipedalism. Human laughter is a “derived form” of primate laughter (Gervais et al, 2005). Laughter and humor emerged for all primates, including humans, six and a half million years ago. In the next two and a half million years, four million years ago, bipedality emerged which gave humans laughter in its current form. With the emergence of bipedality the “morphological constraints” were removed from the type of laughter that was produced. Once the hominid line became bipedal, the thorax (the part of the body that holds the heart and lungs, located between neck and abdomen) was no longer subject to the physical restraints of quadrupedal locomotion (Gervais et al, 2005). Breathing and vocalizations were no longer strictly tied to each other as they were with quadrupedal movement. Bipedality allowed the syllable-per-breath ratio to change; with quadrupedal motion, primates are restricted to one-syllable-per-breath so the thorax was not damaged by forelimb impact (Provine, 2004). Once bipedality emerged, there was not a restriction on the amount of syllables to be released per breath. The lifted restrictions turned human laughter into the familiar “series of short, vocal blasts that repeat about every 1/5s” (Provine, 2004).

Laughter and humor are human behaviors that appear around us on a daily basis; from just watching television to interacting with people, humor and laughter are unavoidable parts of life. This paper provided explanations for the laughter and humor from many levels. From a functional level explanation, laughter can be described through the false alarm theory; laughter is a reaction to the release of tension from a perceived threatening situation. The evolution of humor can be described on a functional level in two different ways: for sexual selection in potential mates and to measure interest one has in another person. Finally, this paper looked at the phylogenetic origins of laughter and humor; laughter and humor are not exclusive to humans and have a basis in nonhuman primates. Although adequate explanations are provided for some aspects of laughter and humor, there is still more to be explained through further research.
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References


A Prisoner’s Dilemma: decision making on the individual and group level

Patrick F. Chew

Introduction

As the sun sinks below a Gotham under duress, prisoners in bright jumpsuits are loaded onto a ferry to the chagrin of citizens still on the mainland. Another ferry is loaded with Gotham’s residents, businessmen, mothers, blue-collar workers. The Joker is threatening the entire city and authorities must balance concern with citizens and worries about further destruction if the Joker releases Gotham’s criminals. Suddenly the power goes out on the boats. All communication is lost. The grimy, calculating voice of the Joker comes on over the loudspeakers:

“Tonight you’re all going to be a part of a social experiment. Due to the magic of diesel fuel and ammonium nitrate, I’m ready to blow you all sky high. Anyone attempts to get off their boat, you all die. Each of you has a remote to blow up the other boat. At midnight, I blow you all up. If however, one of you presses the button, I’ll let that boat live. So who is it going to be, Harvey Dent’s most wanted scumbag collection or the sweet and innocent civilians? You choose. You might want to decide quickly because the people on the other boat might not be so noble.”

This scene from The Dark Knight presents an issue of much moral ambiguity and illustrates the concept of a moral dilemma—a tough choice in which
something bad will happen, but the subject must weigh and decide between the two bad options. While such a situation is not an every day occurrence, subjects still must frequently make difficult decisions in which there is no absolute right and wrong. The passengers are presented with a two-part dilemma. First, by waiting, the people give Batman a chance to save them, but risk the other boat destroying them. Second, regardless of Batman, the passengers face the disconcerting decision to kill others.

Much of the work being done in moral psychology in recent years deals with the concept of a “Universal Moral Grammar,” an underlying sense of moral instincts that all humans possess. Studies in Universal Moral Grammar involve the analysis of a large number of subjects who make decisions regarding difficult moral dilemmas; similar decisions by a wide range of individuals suggest that we may have a Universal Moral Grammar. Although we may have an innate set of subconscious morals as individuals, the decisions we make in life are often as groups: families, boards of directors, committees, teams, or legislatures. We rarely make decisions based solely on our personal thoughts or personal moral intuitions, rather our judgments can be greatly influence by group pressure and group discussion, making us more polarized and more rational.

Universal Moral Grammar

Universal Moral Grammar (UMG) is a term used to describe the idea that humans have a universal, innate concept of morality. UMG attempts to tie together similarities in moral judgments using components and models similar to those used in the study of linguistics. UMG seeks to answer five basic questions concerning both proximate and ultimate issues related to morality: What is moral knowledge? How is this knowledge acquired? How do we use this knowledge? How is this knowledge a part of the physical aspects of the human brain? How did this knowledge evolve? (Mikhail 2007). Proponents of UMG assert that before we engage in conscious thought, we instinctively respond to moral situations by delivering responses to right and wrong. Our brains are somehow orchestrated in such a way that allows us to use a set of morality tools with which to assess moral problems (Semeniuk 2007). The initial evidence for Universal Moral Grammar stems from studies concerning judgments in morally difficult situations.

The trolley problem is an often cited thought experiment in ethics which has two variations: the ‘bystander’ and the ‘footbridge’ situations, which present two similar choices for a subject to make. In the bystander situation, a bystander (let’s call him Bruce) is standing on the side of a train track—on the
main track there are 5 people, and on a sidetrack stemming from the main, there is one person. Bruce can pull a lever, changing the direction of the train killing the 1 instead of the 5. Is it morally permissible for Bruce to turn the train? In the second ‘footbridge’ situation, a person (let’s call him Harvey) is standing on a footbridge directly over a train track. Harvey sees a train careening towards 5 people he knows the only way to stop the train is by placing a heavy weight into the train’s path, but the only sufficient weight is a large man standing on the bridge. Harvey can push the large man, stopping the train and killing one instead of 5. Is it morally permissible for Harvey to shove the man? (Hauser et al 2007). A study by Marc Hauser et al shows that in the ‘bystander’ situation, 85% of some 5,000 subjects from 120 countries (although with a high bias towards English speaking subjects) believe it is morally acceptable for Bruce to pull the lever. In the ‘footbridge’ situation, 12% of people believe it is morally acceptable for Bruce to pull the lever (Hauser et al 2007). Results such as these convey that humans come to very similar moral conclusions despite different backgrounds. These judgments seem to be shared among many diverse populations, even when considering age, education, race, or religion (Mikhail 2007). There is a somewhat universal consensus on how moral issues differ if they are foreseen or intended. In the case of the bystander, the death of the one individual instead of the 5 is foreseen as a byproduct of some indirect action. In the case of the footbridge, the subject is directly causing the death of the other individual through direct contact, so the death is intended. Subjects agree for the most part that actions that lead to negative consequences are morally acceptable if foreseen but not if intended.

Hauser cites the double effect principle as an important concept in explaining these trends. This principle centers on the fact that that two acts similar in consequence (saving five lives or one) can be different when defined morally. The double effect principle holds that harming an individual may be acceptable if the harm is not the harm is a foreseen side effect, rather than an intended and necessary means to a greater good (Hauser et al 2007). By the double effect principle, it would be acceptable to bomb an enemy headquarters to end a war quickly, even if civilians were harmed, because although the harm was a foreseen side effect, ending the war quickly holds a higher value than the lives of those civilians. On the contrary, it would not be acceptable to bomb that same headquarters in order to kill civilians and terrorize the enemy into surrender. In this case, the harm is intended and is a mean to achieve surrender. Even if the same number of people die and the war ends at the same time, the two situations differ distinctly when defined morally. While the double effect principle does help clarify some of the reasons why we might judge the way we do after the fact, do humans employ this principle while making decisions?
The commonalities of patterns of judgments in these situations provide some basic evidence for a common system of moral analysis. However, scientists studying Universal Moral Grammar do not simply look at those decisions which seem to be common across a large range of demographics, they attempt to elucidate how we reach these common decisions. Hauser continued his study by classifying the justifications for action that his subjects gave and analyzing how these justifications play into the utilization moral knowledge. By studying these justifications, Hauser asserts an earlier idea proposed by Jonathan Haidt: the idea that we first make unconscious moral decisions and then later justify them. This, and Universal Moral Grammar itself differ from the traditional model of moral judgment in which morals and emotion are the product of reason and conscious thought processes.

Hauser’s study categorizes justifications for a double effect dilemma into three categories: 1) sufficient justification, 2) insufficient justification, and 3) discountable justification. A sufficient justification correctly identified the differences between the two scenarios, and the subjects claimed this difference as the reason for the moral judgment. An insufficient justification is a simple qualification, ‘my gut just told me it was right’, an explanation without reason, or a utilitarian justification (greater good response). The final category of discountable justifications included assumptions that were not in any way assumable in context (Hauser et al 2007). Among 330 subjects, 30% provided sufficient justification and 70% provided insufficient justification (Those who provided discountable justifications were not included in the pool). Also emerging from the study of justifications was that redirection (bystander) and introduction (footbridge) were important factors in morally distinguishing the two situations. In this vein, subjects were also concerned with whether they the action they were causing was personal as in the case of the footbridge problem because of direct physical contact, or impersonal, as in the pulling of a lever in the bystander problem. The results show that despite similar moral judgments, subjects express many different justifications for their actions. 70% of subjects in Hauser’s study provided post-hoc explanations that did not align with their judgments. Intuition must be functioning in the judgment process because the subjects had no access to principles used in making these judgments (Hauser et al 2007). The disparity between judgment and justification seems to challenge the idea that we make decisions based on a set of consciously accessible moral rights and wrongs—we are more likely motivated by a subconscious set of principles which we do not explicitly understand and therefore cannot use as justification, a Universal Moral Grammar.

In the context of the relatively new idea of UMG, it seems that the Joker’s prisoner’s dilemma presents a somewhat unrealistic portrayal of what might happen in reality. At least on an individual basis, each of the passengers on the boats would, according to Hauser, subconsciously access the principle of
double effect and press the detonator, as it would be for the ‘greater good.’ However, the boat passengers were not acting as isolated individuals, but as group members. The methods by which groups make decisions differs very much from the way that groups make decisions, so we will explore that next.

Group Think

As the Joker announces his ultimatum the prisoners start shouting, the prisoner guards bear their shotguns, asserting their authority. On the civilian boat, a sea of murmurs quickly turns into a series of loud outbursts. "We oughta talk this over at least! We don’t all have to die, those men had their chance! They’re talking over the same exact thing on the other boat! Lets put it to a vote." In many life situations, the deciding parties are not individuals, but groups, such as families, committees, or boards of directors. The study of how group decision-making can differ from individual decision-making, therefore, is a very important area of exploration. We make our decisions, not as isolated individuals, but with the influence of many other individuals. I will explore two concepts, one of rationality in groups, and the other of group polarization.

A study by Gary Bornstein and Ilan Yaniv uses a group ultimatum game to attempt to discover how groups operate in terms of rationality. The ultimatum game is played with two players, the allocator and the recipient. These two players are allocated some amount of money and the allocator must propose an allotment of this amount between himself and the other player. The recipient may either reject (both get no money) or accept (they are paid the allotments) the proposal. The purely rational assessment of this game predicts that the allocator will allocate as little as possible to the other player and that the recipient will accept any amount, because both are better off than they began. However, results from many experiments show that offers by the allocator are typically from 40 to 50 percent of the allotment and small offers are often rejected (Bornstein and Yaniv 1998). Bornstein and Yaniv studied ultimatum games as played by groups of three individuals, acting in place of each player. The three group members were allowed to discuss their opinions and, working together, chose how much to allocate and whether or not to accept offers. The results, taken from a relatively small pool of 80 male students in Israel, show that in general, groups acting as the allocator distributed less money than an individual would to the recipient group and that this recipient group was more willing to accept these smaller offers than an individual would be. The allocators gave themselves an average of almost 10 percent more money than in individual studies.

These results shift towards the “rational” prediction of what should happen in an ultimatum game. So are groups more rational than individuals? The groups may have better understood the strategy of the game and so were able
to make rational decisions earlier on in the game than individuals. While some (Camerer and Thaler, 1995), have argued that the misunderstanding the ultimatum game is not realistic, exploring this possibility is still important. Further, groups may be more competitive than individuals. However, this option does not seem to apply because there were lower rejection rates by the recipient group than in individual ultimatum games. These results also may be related to the fact that group discussion can often lead to amplification or affirmation of previously held bias (Bornstein and Yaniv 1998). Further experimentation is needed, but at least from this small sample, it seems that groups act more rationally than individuals. How might this accentuation of rationality be explained? Cass R. Sunstein has explored the Law of Group Polarization, a possible explanation for this trend towards rationality in groups.

Group discussion is an extremely relevant topic, especially to a nation like ours that forms its identity from democracy and the sharing of all opinions and ideas. Philosopher John Rawls relates that “discussion is a way of combining information and enlarging the range of arguments [É] No one knows everything that others know, or can make all the same inferences that they can draw in concert” (Sunstein 1999). Conventional wisdom, at least until 1961, told us that group deliberation leads to compromise among individuals with different views and risk avoidance. However, studies conducted in 1961 by J.A.F. Stoner revealed that after group deliberation, groups became more polarized and extreme than individuals were. In his experiment, male students were asked a variety of questions related to risk: should the team play safe or choose a risky maneuver as the football game was ending? Should he invest in a high-risk, high-return stock or a lower-risk, lower-return stock? (Sunstein 1999). In his studies, individuals gave an initial judgment on the problem, and then discussed the problems in groups of twelve in order to reach a group consensus. Finally, individuals were asked to divulge their individual judgments after the discussion, even if this view differed from the consensus. Out of all individuals in 13 groups, 16% acted more cautiously after deliberation, 45% remained the same in their judgments, and 39% chose the more risky option. This movement towards the risky, termed the “risky shift”, has been duplicated in numerous other studies. (Sunstein 1999). Group polarization is a simple statistical fact, and is most blatantly apparent historically in events such as Mao’s Cultural Revolution, the anti-slavery movement in America, and Nazism’s rise. These examples are used not to convey that polarization creates inherently good or bad judgments, but that group polarization is, in these extreme forms or in far less extreme forms, part of our every day lives.

Group Polarization is affected by two factors, which have both been extensively researched: social comparison and persuasive arguments (Sunstein 1999). Social comparison is related to the fact that people want to be recognized in a positive light by other group members as well as see themselves in a positive
light. When individuals hear the views of others, they may adjust their positions in order to seem overly cautious or cowardly. People are continually concerned with maintaining positive reputational signals, even if this means failing to convey what they truly think. The second component in polarization, persuasive arguments, is related to the fact that groups will polarize towards the views of those who have convincing arguments for their positions. When individuals hear valid, memorable, or well-conveyed arguments, they will shift in the direction of these views. Both of these factors can play an especially important role in a limited argument pool. If some people are not fully aware of the issues surrounding a topic, the less informed individuals will take on the views of the knowledgeable individuals in order to appear knowledgeable as well.

With the prevalence of group polarization and the constant shifting of views because of desire to maintain positive reputations and self-conceptions, does deliberation do anything to help convey the views of group members? If shifts occur because of skewed argument pools, the ultimate judgment reached by a group may not be anywhere close to an accurate reflection of the individual views of each person. Abstractly, it is impossible to declare whether the tendency towards polarization in group deliberation is good or bad. However, the fact that this tendency exists calls into question whether deliberation, a practice built into our government and our every day lives, is beneficial. It is possible that the structure of deliberation must be altered to avoid polarization by conveying that full information and honest opinion is vitally necessary. The phenomenon of group polarization points to the fact that deliberation, though a common part of our every day lives, is not necessarily the best method of arriving at the truth or at the best judgment.

The situation presented in The Dark Knight may not be a reflection of a realistic situation, but it does present an interesting example of a difficult moral dilemma, an issue with two bad options. Ultimately, Batman saves the day, so all is well in the imaginary Gotham. But in the real world, there is no Batman, so the study of decision-making processes on the individual and group level is very important. The study of Universal Moral Grammar, while shedding light on the intrinsic moral intuitions humans may have, cannot really predict how individuals will act, especially because others often influence our decisions. The decisions we make are often in groups, which can make our judgments more rational as well as more polarized. The topic of moral dilemmas, especially in relation to groups, calls for much more exploration. Ultimately, however, we must call into question the way we make decisions, both individually and as groups, to ensure that we understand the reasons for our choices.
pursues his love of all forms of art through his current website, Code&Creed. He also dances for the premier hip-hop dance team at UCLA, Samahang Modern.

References


Why, Peter, Why?!

JESSICA PRAY

In the movie “Forgetting Sarah Marshall”, protagonist Peter Bretter finds himself trapped in the throes of love. While chasing after his celebrity ex-girlfriend in order to mend his broken heart, he unwittingly dives deep into a new romance with the beautiful, Hawaiian hotel clerk that offers him a second chance at finding love—and a great price on his hotel suite. Through the sensitive, honest nature of his character, Peter demonstrates the role that emotions play as a dominant force acting on human behavior. When he is forced into a situation that could potentially destroy his budding romance with hotel clerk Rachel, he feels obligated to tell her the truth about the scandalous sexual encounter with his ex-girlfriend, when a simple lie could have spared him the trouble of mending their relationship. This feeling of obligation to tell the truth despite the possible adverse effects is socially defined by the emotion of guilt.

The idea of guilt is a puzzling concept when considering the human race as yet another mammal species. By the Darwin standard, only the fittest survive and reproduce, making self-interest seem logical for an individual to maintain competitive advantage. However, within the evolution of human society and subsequent division of labor, the need to cooperate requires adaptive behavior. These adaptive emotions, such as guilt, serve to sustain advantageous relations between individuals. Specifically, guilt works to identify and reverse damage done to a cooperative relationship. Furthermore, an individual’s anticipation of guilt often leads them to refrain from intentionally acting to damage a healthy relationship (Fessler and Haley 2003). Although most researchers agree upon the general function of guilt, there are many different ideas concerning the emotion’s development within individuals. Furthermore, researchers have made distinctions among different types of guilt and have postulated the origins of guilt within the human mind.
Although he was not entirely thorough in his definition, the first developmental account of guilt came from Freud. From his background in psychology, Freud claimed that guilt is not provoked by reality-based actions, but that it is a subconscious anxiety resulting from punishment or abandonment by parents. When an individual is threatened with an external loss of love from authority figures, the tension is translated into an internal sense of unhappiness, known as guilt. The guilt does not reflect the external reason, but rather the tension existing within one’s own mind (Hoffman 2000). While his account acknowledges the pathological quality of guilt, it fails to explain the reality-based nature of the emotion.

Later in the 1960s, researcher Martin Hoffman theorized that guilt is not merely a subconscious anxiety, but an emotion based in empathy. Empathy, the ability to identify and interpret the feelings of others, gave guilt the basis in reality that Freud’s interpretation lacked. Hoffman defined his theory of inter-personal guilt as a feeling of disesteem for oneself, usually accompanied by feelings of urgency, tension, and regret. These feelings, he says, stem from the acknowledgment of another’s distress, along with the awareness of being the cause of that distress (Hoffman 2000).

Hoffman comes to his conclusion for empathy-based guilt from many different areas of evidence. A narrative account of empathy-based guilt is shown in the research of Tangney et al in 1996, where both adults and children expressed empathic feelings when asked to recount and describe an episode of guilt. Also, they found a positive correlation between tracked measures of empathy and guilt in college students, and other young children and their immediate family members (Hoffman 2000). The results of another study provided experimental evidence in support of a link between empathy and guilt. Subjects watched a video of a boy inflicting pain on another person. After watching, half of the subjects were asked to consider how the victim must have felt, and half were asked to not consider the victim at all. Those subjects who were asked to feel empathetically scored higher in their proposed guilt, than the observers who were asked not to think of the victim at all. From this, Hoffman argues that the arousal of guilt is largely based on the capability to feel empathetically for the victim, whether the person is the actual transgressor or merely witnesses harm being inflicted on another.

Within these studies however, an interesting distinction is made between two different types of guilt; people reported the same feeling of personal guilt even when they were not personally inflicting harm. Typically, guilt is looked at from a first-person perspective. Transgression guilt, or true guilt, can be seen as the consequence of directly inflicting harm on another, whether purposely or accidentally. The sympathetic distress of causing such pain, combined with the acknowledgment of it being one’s own fault, is the most common guilt ex-
perience (Puka 1994). However, true guilt can also be elicited from omission, as often as from commission. A situation in which one passively observes as a small child gets pushed leads to guilt from omission, or the decision for inaction. In both cases, true guilt tends to lead to some sort of reparative behavior in order to reduce the feeling of guilt and mend the relationship (Puka 1994). If reparative behavior is unavailable or the opportunity has passed, the feelings of guilt are prolonged and may provoke the subject to resolve to become more considerate of others in the future (Puka 1994).

However, the emergence of guilt is also seen in situations where the subject is not the cause of the transgression. Virtual guilt arises from a subject feeling as if they were the cause of another’s pain, although they did not commit any sort of transgression. This existential guilt takes root in the normal aspects of living, such as close relationships, family love, achievement, and self-fulfillment (Hoffman 2000). Although virtual guilt may be based in some sense of truth, these commissions cannot be classed with actual transgressions because they have no intention of harm and have not typically violated any moral principles (Hoffman 2000).

As social beings, the behavior of one human will inevitably affect both the world, and the people, who surround them. Thus, existential guilt takes many forms. A main form of virtual guilt, relationship guilt, appears in situations such as when one partner hurts the other, and therefore threatens the stability of the relationship. Partners in a relationship become so close that their moods and behavior are dependent on that of the other, and therefore each person understands the potential impact their actions will have on the other. Although the inflictor may not mean harm, and merely act under misunderstanding or carelessness, the victim still feels upset and the relationship may be temporarily unstable. This transgression, although unintentional, leads to relationship guilt and the subsequent need for repairing and mending. This may be the main cause of our dear friend Peter’s guilt from “Forgetting Sarah Marshall”. Having been seduced and quite literally, sucked in to committing an act that would damage his relationship with Rachel, he immediately recognizes the need for explanation and reparation. Hoffman claims that relationship guilt can, in this way, forward a prosocial goal. The threat of guilt influences partner’s to actively express positive feelings and strengthen the relationship, as well as conversely try to avoid hurting, disappointing, or neglecting their partner. The expression of relationship guilt shows care for the other, and motivates more stable, healthy, trusting relationships.

Responsibility guilt, similarly, is a virtual guilt that “stems from having responsibility for someone who is harmed, even when it is clear that the person is not at fault” (Hoffman 2000). When given responsibility for another, one feels obligated to protect and support them. Therefore, even if the person
who is responsible does not instigate a harm done to the victim, the person will empathize with the victim’s pain and feel as if they should have acted differently (Hoffman 2000).

The causal influence empathy has on guilt leads to many other virtual transgressions that arise from merely living one’s own life. For instance, separation guilt may occur when a child leaves home and consequently saddens his parents. Although the child is not at fault and must carry on in his path, empathy leads him to feel that he is causing loved one’s pain, and therefore feels guilty. Similarly, achievement guilt occurs when one’s personal success makes close peers feel inadequate or relatively unsuccessful, as does guilt over affluence. The person afflicted by guilt has no obvious control over his superiority, but nonetheless feels at fault because he is able to empathize with those less fortunate. Lastly, survival guilt arises when a particular person finishes unscathed a dangerous task, while others of his party suffer major injuries or death. The haunting question of survivors as to why they, particularly, were chosen to live causes them to feel guilty over living when other deserving people are not. Although these feelings of guilt seem highly irrational, empathy drives humans to appropriate blame whether it is deserved or not.

However, the argument as to why humans feel guilt and other moral emotions has so far been left incomplete. Hoffman argues that humans feel guilt based on our empathetic capacity to feel for others, but it has yet to be said why humans are able to empathize in the first place. What makes a person capable of acknowledging and understanding the pain of others, and subsequently judging their own behavior as a causal influence on other’s suffering?

Recently, many studies have looked to illuminate the development of empathy within children both biologically and as influenced by parenting and upbringing. Biologically, empathy seems to be instilled within the human cache from a very early age, as seen by a situation in which a baby will cry when he hears another cry, or mimic laughter. Although mimicry is also a way of learning, the ability to sense others feelings is underlying in a baby’s unwitting response to another cry (Puka 1994). Eventually, as the child reaches a higher level of cognition, he can distinguish between self-focused and other-focused. This realization that other’s are not experiencing the same thing, but exist independently of one’s self is important in the development of empathy; it is the first acknowledgement that other’s can feel something separate from one’s personal feeling. With further development, a child more solidly grasps the concept of physical entities existing distinct from the self, and then later that these physical entities also can possess other perspectives and identities.

Guilt-like tendencies that support empathetic capacity begin to show in children of about 8-9 months (Mascolo and Ficsher 1995). When a child of this age purposefully hits another, he is able to recognize that his behavior made his
friend sad, and shows signs of personal sadness over the pain of the friend. Then, within a year a child is able to understand behavior that hurts others, and becomes capable of amending the situation with reparative behavior (Zahn Waxler and Robinson, 1995). For example, Hoffman describes a situation in which his baby cousin of 21 months accidentally hit him in the lip with her head. Once she recognized that Hoffman was bleeding, she stopped crying and apologized that she had caused her cousin pain. By 4-5 years, children begin to grasp the relation between another child’s behavior and how it should dictate one’s own actions. If the 4-5 year old does not behave in the way that he ought to, he is able to feel guilt about not reciprocating. Ultimately, it takes up until a child is 10 to 12 years in order to grasp when one is violating a general moral rule about how to treat other people, and are capable of a generally mature empathy-based guilt (Mascolo and Fischer 1995).

However, although biology dictates when children become capable of feeling certain levels of empathy and guilt, many studies have claimed that parental and peer upbringing have critical influence on the cultivation and realization of a child’s empathetic gestures. For instance, social-learning theorists claim that a child learns to be moral by observing moral behavior and imitating such moral behavior in later situations (Hoffman 2000). An argument made by a researcher named Piaget dictates that children must be exposed to other children in a social setting for a proper moral system to develop. He argues that moral behavior and empathy must evolve from cooperation among equals and mutual consent with others, rather than from the influence of parents who are seen as absolute authorities. However, intervention from parents becomes vitally important during a child’s purposeful transgressions. If a baby accidentally hurts a peer, there is more likely to be natural feelings of remorse and reparative behavior. However, in the situation where a child willingly hits a peer in order to take his toys, for instance, the desire and greed blinds the child to his peer’s distress. Without the ability to acknowledge that something wrong was done, let alone that one’s self is the cause, the child would not develop proper feelings of guilt (Hoffman). Parental socialization is important in guiding a child’s moral development; even though young children possess the capability to experience guilt, empathy and morality need to be learned through experience and parental guidance (Kochanska 1991). A study done in child development concluded that parental use of warmth and the open expression of emotions contributes positively to the development of guilt within a child, and conversely that the harsh assertion of power by parents does not. Furthermore, gentle parenting reinforces feelings of wrongdoing within the child, and enhances feelings of empathy, while harsh parenting calluses the child to any inner feelings of empathy or guilt caused by wrongdoing (Kochanska 1991). Ultimately, it is the combination of parental and peer socialization that allows a child to learn empathetic behavior. Although biologically children develop empathetic capacities at a very early age, parental
socialization is important in guiding a child’s moral development.

However, the conclusion that guilt and empathy develop as a result of both biological programming and social construct leaves much to be answered. As a result of thousands of years of evolution, the human body and mind are highly specialized entities. With the exception of that extra kidney, whose presence serves no purpose in modern human life, most everything that develops within the body and mind are present to perform specific functions. Unless one were to irrationally assume that empathetic qualities and guilt acts as the extra kidney of moral emotions, one must conclude that the presence of guilt serves some purpose to human life.

The question of guilt, and other moral emotions’, function in the human body has led curious researchers and psychologists to form theories in response to the challenge. From an evolutionary standpoint, guilt seems to act as a check against selfish tendencies. Many recent studies have postulated that guilt serves as a prosocial motive, and acts as the motivator to maintain healthy, stable relationships with others in the social setting. In the complex social system humans have developed, inflicting pain on selfish actors maintains a stable balance of power. However, inflicting pain on those who are not selfish is damaging to the maintenance of cooperation and threatens the inflictor’s position in the social network (Fessler 2003). Thus, the function of guilt seems to lie in identifying and reversing the damage done to a cooperative relationship. Also, merely the anticipation of guilt serves to prevent one from intentionally behaving in a way that would hurt another (Fessler 2003). This holds true in both close relationships and relationships with strangers. In the close relationship, guilt may motivate people to pay attention to their partner, change their behavior to suit the desires and needs of their partner, and avoid behavior that would intentionally hurt the other person (Baumeister et al., 1994). Guilt in the relationship between strangers acts to preserve beneficial relationships, such as reciprocal altruism. Cooperation between trading partners is beneficial to both actors involved, and the surrounding relationships within the network. Thus, guilt functions as a way to prevent one partner from behaving selfishly, and promotes reciprocation of kindness within a relationship.

However, it is dangerous to speak of guilt and it’s function as a universal truth within all humans. Due to the fact that the development of guilt is both biological and socially constructed, not all cultures emphasize the important of empathetic maturation (Fessler 2003). Although this does not discount the conclusions of research done concerning guilt, it is prudent to understand the fallibility of a supposed ‘universal truth’ among humans.

Among the range of moral emotions that humans experience, guilt proves to be a major player in the lives of everyday people. With the emotional and so-
cial importance that humans attribute to relationships with others, guilt acts to protect these precious networks from man’s inevitable transgressions. Although the definition and origins of the guilt experience have evolved over time, the acknowledgment of its importance to human life has been repeatedly confirmed. Research into the development of guilt within children has led to many interesting conclusions about both where guilt stems from and how it is cultivated within the mind of a child. Most importantly, however, researchers have postulated theories that attempt to answer the time-honored question of why Peter Bretter confessed to Rachel his single crime, with the full knowledge that the lasting health of his wounded heart was at stake.

If you are reading this, I doubt you will ever meet me, and therefore will only be left with the shallow impression of my entire existence based on the information given within these next few sentences. My name is Jessica Pray. The only things I know for certain in life are that I absolutely adore everything there is about the smoothie making and consuming process, and that I will one day be the proud owner of a bull-dog puppy named Meatball. (Or perhaps a child named Meatball, whichever of the two comes into my ownership first.) The end.

References


Pulp Non-Fiction: The Science of Forgiveness in Altruistic Relationships

Josh Canter

After losing thousands of dollars in a bet gone awry, being run over by a small Honda, knocked out and restrained by psychopaths, and raped by the terrible “Zed,” mob boss Marsellus Wallace chose to relieve the boxer Butch Coolidge of his debt in what would be one of the most terrifying and twisted scenes in cinematic history. In Quentin Tarantino’s Pulp Fiction, Butch, after freeing himself from his manacles, is almost out the door to freedom when he realizes that Marsellus faces a dark fate. Dawning a katana sword from his captors’ pawnshop shelf, a weapon associated with honor, he returns to free Marsellus from the subjugation of the rapists. After killing one, Butch obeys Marsellus as his words “Step aside, Butch” echo in the dark basement, and Marsellus blasts the criminal in the crotch with a shotgun. Butch, unsure of what to do, asks Marsellus if there is anymore “You and Me.” Marsellus tells Butch that he’s going to call up some guys to go down on Zed with a pair of pliers and a blowtorch, but as far as Butch and Marsellus are concerned, there is no more “You and Me.” Marsellus tells Butch that he must leave the Los Angeles city limits, and never return, but assures him that he will “stay gone,” or else he’ll “be gone.”

After unleashing hit men on Butch for winning a boxing match that he was plotted to lose, Marsellus decides to forgive Butch and let him live. Why did Butch decide to save Marsellus instead of escape with his girl and the money? What factors empowered Marsellus to rescind all vendettas against Butch? This essay analyzes the actions of the two men in order to gain a better
understanding of their decision-making process, and feelings of vengefulness toward an offender and acts of redemption that will earn forgiveness are what help us understand the reasons behind their actions.

Marsellus Wallace placed trust in Butch Coolidge. Butch was to be in a boxing match, and the odds were grossly in Butch’s favor. Marsellus, a Los Angeles crime lord, paid Butch a lot of money to lose the match. Marsellus would bet against Butch and win large sums of money, and Butch would walk away having lost in the ring, but won more money than he had made in his career. In the movie, as Marsellus warns him, Butch is too prideful to lose, so he wins the match and flees the venue with Marsellus’s money. Marsellus is not happy about this, so he sends his trusted hit men after Butch to find and kill him. After dodging death once, Butch is driving to his motel to pick up his girlfriend and leave the country. At a stoplight, none other than Marsellus Wallace crosses the street with a box of donuts and a cup of coffee in hand. Before Marsellus can do anything after noticing the driver in the car is the man he wants dead, Butch floors it and sends Marsellus flying, but also crashes the car into a pole. After this, Marsellus chases Butch into the pawnshop where their fates take a dramatic turn. Both men disoriented from the collision, the pawnshop owner holds them at gunpoint and binds them with ease. What ensues is the turn of events described earlier, where Butch returns to save Marsellus from rape and death.

Let us begin by discussing Butch’s betrayal and its impact on his and Marsellus’s relationship. The first time Pulp Fiction viewers are introduced to the two, Marsellus is telling Butch that he is going to lose in the big fight, and that Butch can’t let his own pride get in the way of the outcome of the match. This is when Marsellus places trust in Butch to do what he has told him in return for money. At this moment, the men have formed a system of mutual altruism for each is doing the other a favor—Marsellus is paying Butch to lose, and Butch is going to lose the fight so that Marsellus can also earn a payoff from bets he has placed. The only problem is, however, that Butch becomes the “unreciprocating individual” in their relationship by winning the fight, taking Marsellus’s money, and attempting to flee the country. In Trivers’s classic “The Evolution of Reciprocal Altruism”, he discusses in great detail the elements of an altruistic relationship and consequences of “cheating.” The human altruistic system is a sensitive and unstable one, and it will pay to cheat when the partner will not find out, when he will not discontinue his altruism even if he does find out, or when he is unlikely to survive long enough to reciprocate (Trivers, 1971). In Butch’s case, Marsellus does find out, but Butch’s reason to cheat is because his pride gets in the way of him throwing the match, and he believes that the “take the money and run” plan will be of greater value to him than reciprocating to Marsellus.
The problem with Butch’s decision to cheat in his mutually altruistic relationship with Marsellus is that Marsellus has now been betrayed, and he will wish to retaliate. In a relationship with an altruist and a cheater, the altruist is vulnerable because the cheater has taken advantage of the positive emotions that motivated altruistic behavior in the relationship. Moralistic aggression in humans becomes part of a selection pressure for a protective mechanism. In this case, moralistic aggression was selected for in order to select directly against the unreciprocating individual by injuring, killing, or exiling him. Injustice, unfairness, and lack of reciprocity will motivate human aggression and indignation toward the unreciprocating individual. Also, selection may favor a strong show of aggression when the cheating tendency is discovered (Trivers, 1971). Naturally, when Marsellus discovers soon after the fight is over that Butch won and fled, he shows aggression and has the desire to kill him due to Butch’s “lack of reciprocating.”

Betrayal is the perceived violation by a partner of a relationship-relevant norm. Betrayal may involve minor or major normative infractions, and it occurs when the victim believes that the offender has knowingly departed from the norms that are assumed to govern their relationship (Finkel, 2002). Marsellus knows that Butch deliberately departed from the terms of their deal, and will exhibit destructive behaviors toward Butch because he lost Marsellus lots of money. Norms within a relationship are rule-based inclinations to respond to particular interdependence situations of a specific manner, and they constitute the rules by which interaction is governed. Interaction partners might agree that some courses of action are forbidden and that some are mandated. In this case, Marsellus mandated that Butch lose the fight, and Butch broke this norm.

Actual vengefulness is ego-syntonic to the point that overtly vengeful people do not often present themselves for treatment, so researchers are limited in the amount of psycho-analytic data they can obtain from people who will actually seek revenge on those that have wronged them. One in such a state of mind feels powerful, gives the impression of being omnipotent, is caught up in an overriding preoccupation with denigrating the person for damage attributed to the betrayal, and possesses an unshakable intent to push relentlessly for what is felt by the vengeful person to be “justice” (Lansky, 2007). Being the recipient of injustice and entitled to justice in the mind of the vengeful person overrule the legal and ethical considerations of doing harm to not just the betrayer, but to the larger community, including children or bystanders. Within the psychological world of the vengeful state of mind, the world is reduced to a universe of two parties, the avenger and the offender, with no regard for the consequences of this simplified view (Lansky, 2007). After Marsellus is run over by Butch, he draws his pistol and begins to fire at the injured Butch as he is climbing out of the car wreck. In the raucous, Marsellus, disoriented from
the collision, accidentally wounds a woman who was trying to help Butch out of the car. This action exemplifies the “vengeful state of mind” that Marsellus is in after being betrayed by Butch.

The enraged and perplexed Marsellus chases Butch through the streets of Los Angeles until they wind up in the hands of Zed and Maynard, the pawn shop rapists. The two men take Marsellus into a back room of their basement and leave Butch tied up and gauzed in another room. Butch is able to wiggle and tear his way out of his restraints, and he runs up the stairs and is halfway out the door when he pauses. Butch looks back and hears the screams of pain coming from behind the basement door. He glances back outside toward his freedom, and then looks back again toward the shrieks. His facial expression reveals that he is torn in his decision-making process, but he decides to turn around and look for a weapon. How could he leave a man in the hands of these psychopaths, no matter how much he hated him? Butch, after passing on a Louisville Slugger and a miniature chainsaw, decides to go with the Katana sword that is on the top shelf. Armed with the blade of a Samurai, Butch enters the basement to save Marsellus.

Butch knows that he wronged Marsellus by going back on his deal. If Butch had not cheated on this reciprocal relationship, he and Marsellus would not have ended up, bloody and beat, in the clutches of rapists. In a situation where a partner has cheated on a reciprocal relationship and the other partner has found out this fact, the cheater will have paid dearly for his misdeed. The cheater should be selected to make up for his misdeed and should be selected to make a reparative gesture. In this kind of situation, it seems plausible that the emotion of guilt has been selected for in humans in order to motivate the cheater to compensate his misdeed (Trivers, 1971). In an experiment, individuals who broke an expensive machine were more likely to volunteer for a painful experiment than those who did not, but only if their transgression had been discovered (Trivers, 1971). Guilt feelings contribute to the motivation behind reparative altruism. Other investigators believe that guilt is involved, but on the assumption that one feels guilt even when one behaves badly in private (Epstein, 1969). Private transgressions are not as likely as public ones to lead to reparative altruism, and it is possible that the common psychological assumption that one feels guilt even when one behaves badly in private is based on the fact that many transgressions performed in private are likely to become public knowledge (Trivers, 1971).

Humans respond to altruistic acts based on their perception of the motives of the acting altruist. They will tend to respond more altruistically when they perceive the other as acting genuinelly—volunteering to dispatch an altruistic act as an end in itself, without the act being directed toward a gain (Trivers, 1971). Butch saves Marsellus even though he could have escaped to safety.
Pulp Non-Fiction

Butch acts altruistically without intending to “gain” anything—he is honorable, and he could never leave behind a man with a horrifying fate like that of which Marsellus was almost doomed to.

Gandhi suggested that overcoming vengeful impulses and forgiving those who have betrayed us often demands great strength of will. A “motivational transformation” is defined as a basic process of forgiveness in which desires for retaliation are suppressed and replaced with desires for reconciliation. Two social motives have been distinguished in their influence on relationship processes, and could alter how forgiveness unfolds between altruistic relationship partners, are motives for advancement and for security. Also known as promotion and prevention motives, people represent, experience and pursue their goals in a profoundly different way when focusing on one motive over another (Finkel, 2010). The promotion-focused goal pursuit is represented as striving to achieve hopes and rewards that will ensure advancement. Fulfilling these ideals result in achieving positive outcomes and failing to achieve them result in missed opportunities for positive outcomes. This motive involves seeking gains and advancement at the risk of committing errors and accepting losses. Contrastingily, prevention-focused goal pursuits are represented as striving to uphold responsibilities that ensure security. Fulfilling these obligations protect against negative outcomes and failing to fulfill them incurs negative outcomes. Strategies that are used to pursue these responsibilities involve ensuring security and the absence of losses, even at the risk of forgoing alternative courses of action that could lead to alternative gains (Finkel, 2010). Butch chooses the prevention-focused goal pursuit—he chooses to protect Marsellus from the negative outcome of being raped and murdered by sociopaths, as well as choosing to return to rescue him even though he had the potential to escape to safety.

Butch frees Marsellus from the clutches of the sick humans that abused him. Before Butch had saved him, Marsellus was in a vengeful state of mind, and had wanted Butch dead for going against his word and betraying him. After Butch volunteered to dispatch an altruistic act as an end in itself, not expecting to gain anything other than keeping his honor by saving a man’s life. Though Marsellus still felt hatred toward Butch, Butch’s act was genuine, for he had spared Marsellus’s life. As a result, Marsellus decides forgive Butch by reciprocating and sparing Butch’s life through exiling him from Los Angeles and telling him to stay out of the city if he still wants to live. Altruistic relationships are unstable, and if one partner cheats and does not reciprocate, the path that leads to forgiveness involves actions on both partners’ ends.

Josh Canter is a huge film enthusiast, and Pulp Fiction is one of his favorite movies of all time. Born in Los Angeles, only to be moved to Denver at the age of 10, Josh is enthusiastic about being given the privilege to return
home to sunny Southern California and to study at the best school in the world—UCLA.

References


Part IV

Love and Sex
Human sexual attraction is a topic that has been of interest to scientists for generations; the reasons we find the opposite sex attractive vary so much among and between populations that studying it provides for quite a bit of potential research questions. It can be difficult to pin down exactly what makes one human more attractive to the opposite sex than another. Each and every person has his or her own preferences in the opposite sex. We all know what we “like.” But can we even begin to explain why we prefer what we do? On a superficial level, maybe. One explanation is that we like what we like simply because we find certain traits enjoyable to look at, to hold, or, in some sense, to call our own. But is this a functional reason? Or simply proximate? Does evolution play a role? One of the main difficulties surrounding attraction stems mainly from the fact that it is hard to generalize the concept of attraction. Is it universal? Or is beauty strictly in the eye of the beholder? What exactly is attraction? Is it all physical, all intellectual, or a combination of both? These questions make human attraction a difficult yet rich topic of study, and it has indeed been studied quite extensively. An analysis of current research points to the idea that while people undeniably have personal preferences when it comes to attraction, the functional reasons behind these preferences have a basis in evolution and natural selection.

While the subject of this paper primarily concerns human attraction, attraction and sexual selection among other organisms is certainly relevant. There appear to be correlations between the attraction factors in humans and the attraction factors in other animals, suggesting a phylogenetic relationship between the two. That is, the deeper motivations we have for choosing specific traits in mates are evolution-based, and, on that level, are similar to the motivations animals have in mate selection. Research has suggested that human preferences to the opposite sex have undoubtedly come about as a result of
evolutionary development of sexual selection in our ancestors, and it can be useful to examine how other animals choose their mates in order to see where our choices stem from.

Sexual attractiveness and the characteristics that constitute it manifest constantly in today’s society. The media utilizes attractiveness almost relentlessly, using it to sell products, raise awareness, and for a multitude of other purposes. The media portrays attractiveness in certain, specific ways that appeal to most demographics. “Attractive women” are often portrayed as thin, big-breasted, and long-legged. “Attractive men” are often portrayed as tall, muscular, and well-groomed. These media “standards” of attractiveness are fairly consistent among cultures; there isn’t much discrepancy within the media about how to display attractiveness. The fact that these archetypes are cliché at best doesn’t make them any less accurate; there’s a reason why they are used by the media almost exclusively to denote attractiveness.

Why do these attributes provoke such predictable attributes in people? The answer is that attraction to these attributes is most likely a mix of proximate and functional explanations. On a proximate level, men find these women on billboards and on television ads attractive because they’re drawn to the traits they exhibit. They “like” large breasts, long legs, wide hips, or any of the other traits the media portrays as “attractive.” Women “like” tall, dark men with large muscles. On a functional level, there is a deeper meaning behind these traits; that the characteristics used by the media to successfully provoke responses of attraction in people have a foundation in evolution and natural selection.

In nature, animals are attracted to their mates for functional reasons, and though human culture has developed to overlook these functional motivations in many cases, they are ever present in our decisions on what is and what isn’t attractive. For example: young age is an often used attribute to denote attractiveness. Rarely do we see a Victoria’s Secret Billboard with an elderly woman selling lingerie; in most instances, young women are used in this type of advertising. The functional reason for this is that young people (of breeding age) are more capable at reproducing effectively than older people, and on at least a subconscious level, this is why we, as humans, are naturally inclined to be attracted to younger people rather than old. On the same note, many women (specifically in western culture) attempt to exaggerate youthful qualities, such as small noses, feet, and pale, hairless skin, in order to attract men (Barber 1995). While on a conscious level, women are simply attempting to make themselves “prettier,” in reality they are advertising their reproductive value. This principle is evidenced in animal populations as well. One study monitored a chimpanzee population over a period of 22 years, determining the rates of reproductive success for the different males in the population. The
scientists found that the younger male chimpanzees were more successful in sperm competition than the older ones, meaning the potential mates in the population (female chimpanzees) chose to mate with the younger males more often (Wroblewski, 2009).

The same is true of other characteristics as well. A woman’s breasts are synonymous with attractiveness in many cultures; many men prefer women with larger than average breasts (Beck, 1976). Many studies have been done on this subject; one such study consisted of monitoring the number of approaches a woman received at a bar while wearing a bra that allowed her to alter her apparent breast size. It was found that, as many could probably predict, that after increasing the size of the woman’s breasts, the woman experienced an increased number of approaches by men (Guegen, 2007). Functional reasons for men being attracted to large breasts are similar to those that explain why men value youth: reproductive worth. It has been suggested that large breasts are considered a highly feminine trait, and that they are symbolic of a woman’s ability to have children (Millsted & Frith, 2003). It seems only natural, then, that men would be attracted to them; they are representative of a female who is capable of reproduction.

While the media portrays attractiveness using certain predictable characteristics, much work has been done in an attempt to pinpoint exactly what traits, no matter how subtle, provoke attraction in the opposite sex. Studies have been conducted that attempt to catalogue which specific traits we find attractive. Most of these studies involve asking participants to rate pictures of people based on certain physical characteristics. In one such study, 127 men were asked to rate images of 10 individuals of women for attractiveness, both in a short-term relationship and a long-term one. The participants were asked to rate images of the face and the body separately and then combined. In both the short-term and long-term scenarios, facial attractiveness was a significant positive predictor of the ratings given to the combined images (Currie, 2009). That is, the ratings of the women’s faces accurately predicted the ratings of the entire picture (face and body combined). On a proximate level, this may make sense. Many would agree that having an attractive face plays an integral part in deciding one’s attractiveness. On the other hand, it brings up an important question about mate selection. From an evolutionary standpoint, how does facial attractiveness exhibit any type of adaptational fitness? As described previously, traits like youthfulness and large breasts can be explained easily with Darwinist principles. Selection for facial attractiveness, however, is not as easily explained. One possible solution to this question is that facial attractiveness has to do with preferences for multiple traits, wherein people are attracted to a combination of characteristics, which together correspond to an evolutionary quality, but individually appear to have no evolutionary significance. As an example, facial attractiveness, in combination with some
other sexually selectable trait(s), might exhibit a single aspect of mate quality that triggers interest in the opposite sex (Currie, 2009). Another possibility is that mate selection for facial attractiveness simply has no evolutionary basis; that it is simply a cultural phenomenon that has been ingrained into our culture.

Another similar study attempted to determine which, out of all possible, factors ultimately determined attractiveness. Scientists asked forty-nine men to rate 3D videos of forty-three females on an attractiveness scale of 1-10. After taking various measurements on the models, including everything from abdominal depth to stature, researchers concluded that two factors were strongest in determining the attractiveness of the models: the depth of the lower torso at the navel, and waist circumference. The results of the study suggest that women with shallow abdominal depth and small waist circumference are more likely to be healthy and nonpregnant, thus, as is the case with many of the other aforementioned characteristics, conveying reproductive worth to potential mates. What we can gather from studies such as these is that there seem to be general consistencies regarding what people find attractive. Using this information, we can begin to decipher whether or not sexual attraction is a universal concept.

With the completion of countless studies attempting to determine what is it about a person that makes him/her attractive, researchers have attempted to map out human attraction using a scale that, in theory, could be used universally to predict a person’s attractiveness. To some extent, this has been accomplished. One study involved attempting to program a computer to detect facial attractiveness. First, 28 human raters were shown 91 frontal color photographs of young Caucasian females with a neutral expression and were told to rate their attractiveness according to a preset scale. With this preliminary data, 84 different coordinates of facial attractiveness, ranging from symmetry to nose size to a multitude of other factors, were programmed into the computer. 1000 different facial images were then input into the computer to be rated on the same scale the human participants used. Once the machine was calibrated, it was able to make extremely accurate predictions of facial attractiveness in images of faces it had never seen before (Kagian, 2008). From this data, we can conclude that at least when judging facial attractiveness, humans seem to follow some degree of universal scale.

This data, however, appears to contradict the well-accepted idea that people have “types”—certain archetypal ideals that people will always find attractive in a mate, and that may (and usually do) differ from the “types” of others. If it is possible to train a computer to be able to accurately predict whether or not someone is attractive, how could it be that some people may prefer certain traits over others? One important point to take into account is that in the com-
puter study, the participants were all gathered from one culture. That being said, the participants could all have a similar “type”, and the computer could have picked up on this fact and simply returned data that agrees with that specific group of raters. Even if this is indeed the case, the computer was able to accurately predict attractiveness within an entire culture, which is a step in the right direction toward a universal scale of attractiveness. Returning to the topic of “types” and how they can exist, one answer is that they don’t. It is possible that these “types” are only what people think they are attracted to, and what they are actually attracted to is determined with evolutionary considerations. This could be caused by cultural elements (e.g. the media), which attempt to strongly influence what men and women “should” find attractive in potential mates. There is evidence that what a person “thinks” he or she is attracted to may be very different from what he or she is attracted to in practice. While both sexes say that personality attributes are extremely important when deciding attractiveness (Buss 1989), a study of dating behavior found that desirability of the opposite sex was altogether independent of personality traits and was instead predicted by physical attractiveness (Walster et. al, 1966). Another possible answer is that certain traits simply trigger more attraction in some individuals than in others. For example, to two men, a blonde-haired, blue-eyed woman who possesses all of the general features of facial attractiveness (e.g. facial symmetry) will seem attractive, but the man who feels this woman is his “type” might see her as more attractive. If this is the case, it would be logical to draw the conclusion that while attractiveness in its most general form can be catalogued and learned, individuals’ preferences are more dynamic and less likely to be learnable.

One possible hindrance to the generalization of attractiveness is that a majority of the previously mentioned studies only examined American cultural attraction norms, with little consideration to whether these generalizations can be applied cross-culturally. Researcher David Buss has done extensive work on this very subject. In his study, men and women from 37 different regions on Earth were asked questions about what they find attractive in the opposite sex. People were asked to rate the importance of earning capacity, ambition-industriousness, youth, chastity, and, of course, physical attractiveness. The results were that in most cases, general trends of what men and women find attractive in each other could be noted, even across such a large cultural and regional gap. In most of the samples, characteristics signaling reproductive worth, including youth, physical attractiveness (e.g. breast size, abdominal size) were valued equally by the male participants. With the same frequency, characteristics signaling resource acquisition, including strength, physical health, and wealth, were valued most by women. Some characteristics did vary between cultures, however. Ratings for “ambitiousness and industriousness,” for example, were consistent among all but three regions. In places like South African Zulu, men valued women’s ambitiousness and
industriousness far more than in other regions. Outliers such as this are likely caused by radical cultural differences. In Zulu, it is considered the woman’s job to build the family’s house and perform all of the family’s daily chores and tasks (Buss, 1989). This would account for the increased value of women’s ambitiousness and industriousness in Zulu men. Cultural differences such as these explain the inconsistencies among the ratings of attractiveness in different regions. The fact that these attractiveness ratings are consistent across such a large regional gap evidences the idea that attraction is not solely based on cultural influence. It would appear that it is based, at least in some part, in evolution and natural selection, with culture differences having no bearing on certain preferences.

In conclusion, human sexual attractiveness may not be as complicated a matter as it was once thought to be. The media and other cultural elements surely have an effect on what we find attractive and unattractive, but there appear to be larger factors at work. Accurate generalizations of what people find attractive are possible, with very little error even across cultural and regional lines. While some elements of personal preference and cultural influence may come into play when determining attractiveness in the opposite sex, the basic foundation of attraction appears to be evolutionary, influenced only at a minor level by elements of media and culture.

Hello; my name is Ben Powell. Welcome to the most life-changing chapter of this book. Now that we’re friends, I’ll tell you a story. The topic for this paper came about after reading a book called “The Game” by Neil Strauss. In essence, it’s a handbook for picking up women. Funny, yes, but I was interested in the way these self-proclaimed “Pick-Up Artists” seemed to have attraction down to a science. That being said, I became interested in the actual science of attraction, and that has culminated in the brainchild you see before you. Enjoy.

References


Nature versus Nurture: Effects on Sexual Orientation

Lee Rubinoff

Background Information

Some scientists believe that people act as they do as a result of genetic predispositions or even instinct. This is known as the “nature” theory of human behavior. Other scientists argue that people think and behave in certain ways based on how they are taught and the environment in which they live. This is known as the “nurture” theory of human behavior (Powell, 2006).

The debate over the importance of heredity and environment in human development is one that can be traced back many centuries. The use of the words “nature” and “nurture” to frame this debate can be attributed to Francis Galton. In 1874, Galton published his work titled English Men of Science: Their Nature and Nurture. In this work Galton calls nature and nurture “a convenient jingle of words, for it separates under two distinct heads the innumerable elements of which personality is composed. Nature is all that a man brings with himself into the world; nurture is every influence that affects him after his birth.” Interestingly enough, in 1911 a 13th century French manuscript was uncovered in which these terms were conceptually explored (Groff and McRae, 1998). The manuscript, Silence, is the work of Heldriss of Cornwall. It contained the story of a girl who disguised herself as a boy in order to avoid the unjust inheritance laws of the time which forbade inheritance by a woman. In this story, the girl encounters two characters, Nature and Noreture, who act as allegorical personifications of the influences of heredity and environment. Nature and Noreture engage in a fight over who is the true author of a person
In essence, both sides of this “fight” are partly correct. We are born with certain abilities, traits and a specific genetic makeup. These things define our nature. Nurture, on the other hand, takes these genetic traits and shapes them as we learn and develop in the specific environment in which we live. It seems like a simple process, however, there is much more to it. The “nature vs. nurture” debate is still very heated, as scientists continue to argue over the amount by which we are shaped by genes and the amount by which we are shaped by the environment (Powell, 2006). For instance, traits such as eye color, hair color, and blood type are inarguably determined by genetic makeup. Science has proven that nurture plays no role in determining such traits. However, it is not clear whether one’s intelligence, personality, disposition toward aggressive behavior and sexual orientation are encoded in their DNA, and thus genetically determined, or if nurture plays a role. Supporters of the nature theory of human behavior would say that one’s intelligence, personality, disposition toward behavior and sexual orientation are all encoded in a person’s DNA, while supporters of the nurture theory would argue that traits like these are “variable” and can change based on influences after birth.

Recently, there has been much debate surrounding the topic of sexual orientation and whether or not one’s sexual orientation is influenced by nature and nurture. Sexual orientation is defined as one’s preference in sexual partners, that is, one’s predilection for homosexuality, heterosexuality, or bisexuality (Dictionary.com, n.d). It is my position that the cause of homosexuality is still a mystery, and that the effects of nature and nurture on ones sexual orientation are still unknown.

Same-sex orientation is a mystery on many levels. From an evolutionary perspective, it lowers fertility within species, and thereby decreases reproductive success. There is also a much higher incidence of sexually transmitted disease among men who engage in same-sex relationships than among men who exclusively engage in heterosexual behavior (Langstrom et al., 2008). The frequency of same-sex sexual orientation differs over time and geographic location. Surveys show that the occurrence of same-sex sexual orientation is between 3% and 20% in males and between 2% and 9% in females (Langstrom et al., 2008). Not only, as noted above, does homosexual behavior play a role in sexually transmitted infections in men (Langstrom et al., 2008), it is also associated with a higher risk of physical and psychiatric morbidity among both men and women than the risk of physical and psychiatric morbidity borne by heterosexual men and women in the same population (Langstrom et al., 2008) Therefore, understanding the determining factors of one’s sexual orientation could be beneficial for professionals concerned with sexual health in general, as well as those concerned with the psychological health of non-heterosexual
Nature versus Nurture: Effects on Sexual Orientation

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populations. On an evolutionary scale, there is evidence in some modern Western societies that homosexual males and females have a noticeably lower lifetime offspring production, sometimes measuring up to 80% lower than heterosexual males and females (Gavrilets and Rice 2006). Clearly homosexual behavior has an adverse effect on the reproductive success of the individual. Even if only a small fitness cost is assumed to the expression of homosexuality, it appears to be more common in both males and females than can be explained by mutation-selection balance (Gavrilets and Rice 2006). Given these costs, why does this behavior exist and persist?

Many different studies have been conducted under different methods to explain this phenomenon. These methods include twin studies, family studies, environmental effect studies and genetic effect studies. Each of these methods have their benefits and drawbacks. Twin studies can be used to study the relative importance of genetic and environmental origins of same-sex behavior. (Langstrom et al, 2008). Environmental effect studies examine the effect of a certain environment on an individual’s sexual orientation, while genetic studies try to link certain genetic traits with an individual’s sexual orientation. In an effort to decipher the relationship of nature and nurture, multiple studies and their findings will be presented.

Twin Studies

There have been a few major twin studies thus far in modern scientific research. Langstrom et al. (2008) conducted a population-based survey of all adult twins in Sweden. This survey was conducted between the years of 2005-2006 and used twins between the ages of 27-47. This recent study is the largest twin study of same-sex sexual behavior attempted so far, consisting of 3,826 studied monozygotic and dizygotic same-sex twin pairs. Langstrom et al. collected data from these twins on all short term, long term, and lifetime same-sex sexual partners. Previously, Kendler et al. conducted a study held in the United States from a National household sample of 1,128 people between the ages of 25-74. The study was performed from 1995-1996 and subjects’ self-reported sexual orientation with response options as heterosexual, homosexual or bisexual. Lastly, Bailey et al. conducted a twin study in Australia during 1992. Their sample was based on twins volunteering for the study. During their study, the subjects’ mean of sexual attraction and fantasies were both rated on 7-point Kinsey scales, and divided into three ordinal categories.

In the study conducted by Langstrom et al. in men, genetic effects explained .34-.39 of the variance in homosexual behavior, the shared environment .00, and the individual-specific environment .61-.66 of the variance. Estimates
among women in this study were .18-.19 for genetic factors, .16-.17 for shared environmental, and .64-.66 for unique environmental factors. (Longstrom et al, 2008). In the study conducted by Kindler et al. genetic effects accounted for .62, the shared environment .05, and the individual specific environment .33 of the variance, with no information on sex differences (Longstrom et al., 2008). Lastly, in Bailey et al.’s study, genetics accounted for .45 for men and .08 for women, the shared environment .00 for men and .41 for women, and the individual-specific environment .55 of the variance for men and .50 for women (Longstrom et al., 2008). The findings of Longstrom et al. largely agreed with the estimates found by Bailey et al. (2000) but less so with those reported by Kendler et al. (2000) (Longstrom et al., 2008). (Figure 1) An important issue to note is that heritability is not a fixed parameter because it can change during life. Due to the fact that heritability is the ratio of the additive genetic variance to the total phenotypic variance, a variation in environmental factors can either increase or decrease heritability, even if genetic factors are equal. (Bochud et al., 2005) Therefore, it makes sense that different studies based on different populations have yielded different heritability estimates (Alanko et al., 2009). The single definable conclusion we can draw from all three sets of data is that sexual orientation is not completely based on genetics, nor is it completely based on environmental factors.

There may exist a correlation between genetic effects on gender atypical behavior in childhood and sexual orientation in adulthood. Alanko et al. 2009 used a population-based sample of 3,261 Finnish twins aged 33-43 years to test this relationship. These participants completed surveys on recalled childhood behavior and on same-sex sexual interests and behavior which were combined into a childhood gender atypical behavior and a sexual orientation variable (Alanko et al. 2009). The results proved that there were significant parallels between gender atypical behavior in childhood and adult sexual orientation indicating that the two observable facts were related. Alanko et al. found that there was a stronger association between these two variables in men than in women (Alanko et al., 2009). Genetic analysis showed that variation in both childhood gender atypical behavior and sexual orientation was partly due to genetics, with the rest explained by nonshared environmental effects (Alanko et al. 2009).

Parental attitudes toward their gender atypical children don’t seem to affect their probability of becoming homosexual. In 1999, A Finnish study that assessed parental attitudes toward gender atypical boys and girls was conducted by Sandnabba and Ahlberg. In this study, gender atypical boys had a higher likelihood of becoming gay than did gender atypical girls (Alanko et al. 2009). These studies may have been influenced by the lay theory of homosexuality. This theory argues that gender atypical behavior is less accepted among boys than it is among girls. This theory goes on to say that it is possible that since
gender atypical behavior in childhood is more frequent in girls than in boys, it causes the boys who display gender atypical behavior to stick out more than girls who display gender atypical behavior. As a result, more effort will be made to correct gender atypical behavior in boys. The gender atypical girls blend in with their female friends and are expected to grow out of their masculine characteristics by adulthood (Alanko et al., 2009). If gender atypical behavior was more socially accepted for boys, the strength of the association might wear down by adulthood (Alanko et al., 2009).

**Genetic Studies**

Scientists have known for years that certain traits are determined strictly by one’s parents and that nurture plays no role in determining such traits. These traits include but are not limited to: eye color, hair color, blood type and skin color. Yes, it is true that the environment can slightly affect some of these things, such as getting a tan, but in general, one will be born white if one’s parents are white or black if one’s parents are black. People who believe in the nature theory also believe that sexual orientation is encoded in an individual’s DNA and belongs to the list of gender traits above. In order to test this, scientists such as Ellis et al. and Iemmola and Ciani have performed various studies.

In 2007, Ellis et al. performed a study that explored the possible genetic links between eye color, hair color, blood type, and the Rhesus factor to sexual orientation. The rationale behind this approach examined the following hypotheses: to the extent that sexual orientation is genetically influenced, the contributing gene might be located on a chromosome that is involved in determining eye color, hair color, blood type, or the Rh factor (Ellis et al., 2007). If this were to be true, one would expect sexual orientation to co-vary with one or more of these four traits. (Ellis et al., 2007)

In order to conduct this study, Ellis et al. took a sample of 7000 Canadian and American college students, supplemented with additional online contacts. Each participant was asked to indicate whether they considered themselves to be homosexual, heterosexual, bisexual or undecided. All undecided responses were removed from the study, while homosexual and bisexual were coupled together. In the same survey, these participants were asked to also indicate hair color, eye color, blood type and Rh factor. Hair color was split up into four categories: black/dark brown, brown/brunette, auburn/red/strawberry blond, and blond/sandy. Eye color was split up into three categories: brown, hazel, and blue/gray/green. For blood type and the Rh factor, there were not enough students who reported this information, so internet contacts were
supplemented into the study. For blood type and Rh factor there were not enough students who reported this information, so 698 male and 1,386 female internet contacts were supplemented into this study that were willing to disclose their blood type and whether they were Rh+ or Rh-. This information was collaborated into a table which allowed the following conclusions were drawn. (Figure 2)

No significant differences were found between heterosexual and homosexuals regarding eye color or hair color. However, in the case of blood type and Rh factor, the table displayed interesting results. Heterosexual males and females displayed identical statistical frequencies of the A blood type, while gay men exhibited a relatively low incidence and lesbians a relatively high incidence. Results for the Rh factor were also remarkable. Unusually high amounts of homosexuals of both sexes were Rh- when compared to heterosexuals. Taking all of this information into account, a connection may exist between sexual orientation and genes both on the chromosome where blood type is determined (chromosome 9) and on the chromosome where the Rh factor is regulated (chromosome 1). Although this sounds conclusive, further research is needed to verify these findings (Ellis Et al., 2007).

Environmental Studies

William H. James (2004) has previously suggested that adolescent and adult male homosexual orientation is in some cases causally associated with sexual or quasi-sexual childhood experiences. He has argued, however, in his more recent study that available data on children raised by same-sex parents cannot provide supporting or refuting data to this suggestion (James, 2004). To support his statement, he presented the following information: A study conducted by Bailey et al. (1995) reported that of 75 young adult sons of gay or bisexual fathers, 9% (i.e. seven sons) were non-heterosexual. Similar percentages (10%) were reported by Bailey and Pillard (1991) and Patterson (1992). Another small study was performed by Tasker and Golombok in 1995 which included 25 children from lesbian families (eight male, seventeen female) and 21 children raised by single heterosexual mothers (twelve male, nine female). By the time they were adult, significantly more of those brought up in lesbian households were reported to have been involved in same-sex relationships. To be exact, five daughters (out of seventeen), and one son (out of eight), were involved in same-sex relationships (James, 2004).

Data on the effects of children raised by same-sex parents is not abundant, although it is apparent that there are high reported rates of non-heterosexuality in the adopted children (of both sexes) of same-sex parents (of both sexes).
Some commentators have concluded that these associations are probably causal. Other commentators, however, have concluded that such parenting has no appreciable effect on the sexual orientation of the children (James, 2004). James (2004) has suggested that the available data is not sufficient to provide a conclusion in one direction or the other. Rather, more research and testing are needed in this area to provide more conclusive results.

**Conclusion**

The debate of nature versus nurture is still heated. Over time, it has become a debate that has put science to the test. The topic of human sexuality and how it occurs is still puzzling. The data presented thus far has confirmed the fact that we still do not know how one’s sexual orientation is determined. Twin studies have led to conclusions that both environment and genetic makeup play a role. In addition, the genetic study by Ellis et al. (2007) has only been able to support that one’s sexual orientation does not appear to be determined on the same chromosomes that determine hair or eye color. They leave it open-ended by stating that sexual orientation could be determined on the chromosomes which determine blood type and Rh factor, but this is still inconclusive. This also leaves the possible that sexual orientation could be determined by one of the numerous chromosomes not tested in the study by Ellis et al. (2007). Lastly, the study of environmental effects by James (2004) has also not been able to provide any conclusive data on this issue. The answer to the long-lasting question of how much one’s sexual orientation is determined by nature and nurture still needs further exploration and will make progress in the future as science continues to advance, pushed by the challenges these studies create.

**Lee Rubinoff** is currently pursuing a B.A. in Business Economics at UCLA. He smoothly transitioned from a high school graduating class of eight (that’s right eight, as in 8) to California’s largest university. While nothing screams home like the beaches of La Jolla, Westwood’s vibrant atmosphere has served as a good alternative. He is also a fan of Borat. On the occasions when he is not a beach bum he is known to be studying in his room …NOT.

**References**

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http://htpprints.yorku.ca/archive/00000014/00/Silence.htm.

James, W. “The sexual orientation of men who were brought up in gay or lesbian households.” Journal of Biosocial Science 36.3 (2004):371-374.


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Table 2: Demographic and methodological characteristics and major findings of three population-based twin studies of sexual orientation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bailey et al. (2000)</th>
<th>Kendler et al. (2000)</th>
<th>Långström et al. (present study)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country of origin</td>
<td>Australia</td>
<td>USA</td>
<td>Sweden</td>
</tr>
<tr>
<td>Type of sample</td>
<td>Volunteer registry of twins</td>
<td>National household sample</td>
<td>National population register</td>
</tr>
<tr>
<td>Definition used for sexual orientation</td>
<td>Mean of sexual attraction and fantasize, both rated on 5-point Kinsey scale, and divided into three ordinal categories</td>
<td>Self-reported sexual orientation with response options heterosexual, homosexual or bisexual attraction</td>
<td>Any lifetime same-sex sexual partner: lifetime number of same-sex partners</td>
</tr>
<tr>
<td>Overall response rate (%)</td>
<td>52.8</td>
<td>60.8</td>
<td>29.6</td>
</tr>
<tr>
<td>Age range of overall sample (years)</td>
<td>17–60</td>
<td>28–47</td>
<td>26–47</td>
</tr>
<tr>
<td>Overall sample size (individuals in same-sex pairs with complete data)</td>
<td>3,076</td>
<td>1,128</td>
<td>7,652</td>
</tr>
<tr>
<td>No. of male twins in same-sex pairs with complete data</td>
<td>968</td>
<td>Not specified</td>
<td>2,548</td>
</tr>
<tr>
<td>No. of female twins in same-sex pairs with complete data</td>
<td>2,008</td>
<td>Not specified</td>
<td>5,004</td>
</tr>
</tbody>
</table>

Summary of parameter estimates

| Genetic | .45 for men (95% CI [.30–.61]) | .68 for women (95% CI [.50–.87]) | .68–.71 for men (95% CI [.40–.89]) | .58–.89 for women (95% CI [.40–.98]) |
| Shared environment | .60 for men (95% CI [.32–.81]) | .57 for women (95% CI [.29–.78]) | .58 for men (95% CI [.19–.78]) | .38–.57 for women (95% CI [.20–.86]) |
| Unique environment | .55 for men (95% CI [.36–.85]) | .50 for women (95% CI [.30–.69]) | .53 with no information on 95% CI or sex differences | .54–.66 for men (95% CI [.40–.71]) |

* Reflects the total number of individuals included in model fitting analyses, although sample sizes varied somewhat within each study depending on the analyses performed.
Figure 6: Effects of Hair Color, Eye Color, Blood Type, Rh Factor

<table>
<thead>
<tr>
<th>Variables</th>
<th>Men</th>
<th>Woman</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heterosexual</td>
<td>Homosexual</td>
</tr>
<tr>
<td><strong>Hair color</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black/dark brown</td>
<td>16.7% (734)</td>
<td>20.8% (12)</td>
</tr>
<tr>
<td>Brown/brunette</td>
<td>57.4% (1,286)</td>
<td>56.7% (34)</td>
</tr>
<tr>
<td>Auburn/strawberry blond</td>
<td>3.2% (72)</td>
<td>5.0% (6)</td>
</tr>
<tr>
<td>Blond/strawberry blond</td>
<td>2.2% (508)</td>
<td>18.3% (11)</td>
</tr>
<tr>
<td><strong>Eye color</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue/grey/gray</td>
<td>48.5% (827)</td>
<td>35.4% (17)</td>
</tr>
<tr>
<td>Hazel</td>
<td>14.0% (239)</td>
<td>16.7% (6)</td>
</tr>
<tr>
<td>Brown</td>
<td>37.4% (638)</td>
<td>47.9% (23)</td>
</tr>
<tr>
<td><strong>Blood type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>31.9% (218)</td>
<td>18.5% (5)</td>
</tr>
<tr>
<td>B/AB</td>
<td>21.7% (146)</td>
<td>23.6% (6)</td>
</tr>
<tr>
<td>O</td>
<td>46.4% (317)</td>
<td>51.9% (14)</td>
</tr>
<tr>
<td><strong>Rh factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rh+</td>
<td>82.6% (479)</td>
<td>70.8% (17)</td>
</tr>
<tr>
<td>Rh-</td>
<td>17.4% (101)</td>
<td>29.2% (7)</td>
</tr>
</tbody>
</table>
As one walks down the street or visits a mall or restaurant, he or she is able to observe many different types of couples; whether it is old married couples, love struck fiancées or “tweens” going steady simply because it’s the “cool thing” to do, couples come in all different varieties and form bonds for many different reasons. Often the general public will look at a beautiful model and see her with a partner who appears to be in a “different league” than she is, and say such things as, “what could she possibly see in him?” People are often judgmental creatures, and it is interesting to see that many people will judge someone else’s relationship without truly understanding what brought the people together in the first place.

There is no single formula for attraction, no universal ideal that would be perfect for everyone, in every country or every culture, but scientists have found that there seem to be universal patterns that appear over and over throughout history and across nearly every culture around the world. While there is always the possibility of exceptions, and of adaptation over time, it appears consistent that while women focus their views of mate choice on stability and the ability to provide, men focus their preferences on physical aspects such as beauty, youth, and other factors generally thought to be related to fertility. These preferences date back throughout our histories as a clear aspect of evolutionary benefit to the reproductive process. Men and women’s roles in relationships are greatly impacted by the complex influences of evolution and survival.
The idea of attraction is a fascinating and complex concept. Attraction is formed through many different factors: including physical, mental, emotional, and social attributes. Many studies have shown women to primarily focus their interest toward aspects of men that would prove the men to be able to provide for the woman and her children in the future. In a study, done by Adrian Furnham in 2009, he studied 140 women (as well as 110 men), in reference to their personal mate preferences, and asked what each participant found most important when looking for a mate. The article found that women rated traits such as “intelligence, stability, conscientiousness, height, education, and political/religious compatibility significantly higher than males” (262). This is largely because, going as far back as the hunter-gatherer societies, women would look to men to provide for them and their offspring. While the women stayed close to home, they would rely on a strong man to venture away from the village to find food and offer protection. Women were so focused on caring for the children that they were dependent on a strong male figure to provide the necessities for the family.

This also makes sense from an evolutionary perspective because women are also more reproductively valuable. That is to say, one man is capable of impregnating multiple women at the same time, but since a pregnancy requires a nine-month investment on the part of the woman, evolutionarily, men are the more expendable of the two sexes. You can accomplish a huge amount of reproduction with one man and many women, but obviously you cannot produce anywhere near as many children in the same period of time with one woman and many men.

In contrast, the men, in Furnham’s study, reported being less interested in questions of physical security and support, and instead were more responsive to issues of female attractiveness and “good looks.” There have been many variations on what constitutes a beautiful woman over time and across cultures. For example, being tan was not considered attractive or healthy until Coco Chanel brought it into fashion in 1923 after she spent a long vacation on a nobleman’s yacht and was seen with a deep tan. Despite these variations, certain factors that scientists have linked to fertility seem to guide the male’s search for a mate. Moreover, another interesting finding that was true for both sexes was that they were quite responsive to “birds of a feather” personality likeness factors, contradicting the commonly held popular (Jungian) belief that “opposites attract.” Overall, though these basic commonalities that started long in the past have proven to carry through both into modern society and into differing cultures.

With regard to the effect of these factors in differing cultures, a very interesting recent study, done by Escobar, Gray and Patton in Ecuador in 2010, examined the mate preferences of Amazonian women towards their male counterparts.
Twenty five Amazonian women rated the attractive qualities of men as being related to their “warrior” and hunting abilities and their status within the community, as well as to their “coalitional” status, that is, their membership in the same “in group” as the woman doing the rating. Also, for reasons apparently related to issues of their strength and ability to be a provider, they also placed importance on younger ages in prospective males.

These findings from a totally different cultural group are also consistent with the findings of two studies with traditional college students done by Michael Wiederman (Wiederman, 1993; Wiederman and Dubois, 1998). In 1993, Wiederman studied 1,111 “personal advertisements” and found that “the results were generally supportive of evolutionary predictiveness: men were more likely than women to offer financial security and honesty/sincerity, and to seek attractiveness, body shape and a photograph in selecting a potential mate; women were more likely than men to offer an appealing body shape and to seek financial resources.” In like manner, women were also more likely to seek “friendship,” with older men, and to offer greater “involvement” only after such friendship existed, whereas men were more likely to explicitly seek sexual involvement, with women who were younger.

In a similar vein, in 1998, Wiederman and Dubois studied 106 male and 114 female college students regarding evolutionarily relevant short and long term mating preferences. In general, they again found that men were more interested in physical attractiveness and sexual interest, and in the possibility of short-term relationships. Women, on the other hand, were more focused on potential mates in terms of their financial resources and their interest in establishing long-term relationships. Interestingly, on a side note, both sexes showed little insight, in this study, into their own mating preferences! All of these studies support the idea that although what constitutes financial or social stability, or what constitutes beauty may vary from culture to culture, the underlying emphasis on those values is near universal.

From another perspective, while continuing with the same evolutionary emphasis, Miller and Maner (2010) studied the testosterone level measured in thirty-seven randomly divided undergraduate men, who were assigned to smell the T-shirt previously worn by a woman who was either in the ovulation (fertile) or nonovulatory (infertile) phase of her period. Their study provided “evidence that men’s testosterone levels are responsive to chemosensory cues indicative of a woman’s reproductive fertility.”

A further study performed by Meier and Dionne (2009), studied the spatial relationship between height and ideals of power in relation to attractiveness. The study portrays support for the tendency that women preferred taller men, and found that height represented the abstract concept of power, even when a picture was shown toward the top of a computer screen versus the powerless
associations of the bottom of the screen. The study showed that women found men who’s pictures were viewed toward the top of the screen to be more attractive, and also felt they exuded the essence of being powerful. Overall this was considered a general trend that women found powerful men to me more attractive and men opted for women who seemed younger and more submissive (aka more powerless). As such, men also were more likely to find a woman attractive if her picture was presented lower on the screen than another’s.

The Meier and Dionne study also demonstrates one bit of confounding information in regards to the idea that women simply look for traits that provide stability. Although in an earlier time (or in a different culture), physicality was more important to overall success. However, with the recent advancements made in developed countries (though there is some data that taller men still make more money), other traits may be far more predictive of stability. In this study, however, at the end of the day, women are still focusing on a purely physical trait. This notable point leads into the idea that despite the genetic or sex related tendencies a person may have for finding a mate, there are other factors.

While all of these studies so far have basically supported the “traditional” perspective of women seeking men who are “hunter-gatherers” and men seeking women who are fertile sex objects, interesting variations on these traditional themes do exist. The consideration of the effects of more feminist ideologies, issues of increasing gender equality and the role of more prominent gay and lesbian influences have an interesting place in issues of preferred mating patterns.

In this vein, Koyama, McGain and Hill (2004) found in a group of 292 university students that, with an increased sense of gender equality and autonomy, women’s mating preferences did not emulate those of men. With an increased sense of gender equality, women were less interested in the financial security that potential mates offered. Rather, they increasingly valued a potential mate’s (male) “kindness, understanding and creativity.” As their earning capacity increased, they favored more attractive men in preference to more financially secure ones. Also they found, in a similar manner, that men with a greater sense of gender equality were more attracted to women with “exciting personalities” than just to more traditional fertile sex objects. This study proves that as times change, people change. With the dynamic between the sexes, as well as broadening of romantic relations to more commonly include same sex couples, the ideals of each gender are subject to change. Though it is unlikely that the fundamental preferences of men and women will change completely, it is possible that many more men will seek further depth in relationships as the world moves further toward gender equality. In the same
assumption it is unlikely women will change their preferences completely, but as they become increasingly successful in higher paying jobs that used to be monopolized by men, women are tending less to look for financial security in relationships. They will be more likely to seek out other more superficial aspects that used to be mainly the mating preferences of men.

The genetic component and the evolutionary question of the significance of homosexuality has often been a hotly debated subject that has an interesting place in the discussion of the evolutionary base to sexual attraction. Recently, a study conducted at the University of Padua found that the existence of a gay man correlated with higher fertility rates than normal in his sisters, mother, and maternal aunts (Camperio-Ciani et. al 2004). Though I am unaware of any specific study that examines this subject in detail, one could imagine that there might be some statistically significant link between a woman’s attractiveness and the sexuality of her brother. The combination of the homosexuality and increased fertility explains why homosexuality has thrived despite apparently being a dead end in terms of passing on one’s genes in a traditional reproductive fashion, and despite the bigotry displayed toward homosexuals.

The issue of gays and lesbians further give us insight into the examination of the idea of stability and physical attraction as the central forces in male and female attraction. Stereotypically, gay men have been known to be very body conscious, whereas lesbians have been stereotyped as moving very quickly into deeply committed relationships, and sometimes even living together almost immediately. Although stereotypes are far from a scientific way of evaluating a group of people, they give us an interesting place to start. It would seem that the emphasis on the body that gay men are known for would be a logical outcropping of the idea that men are interested in physical aspects. Similarly, it would appear that the quick movement into commitment and cohabitation that lesbians are known for would similarly be an outcropping of the evolutionarily based desire for stability found in women. This would make one think that there must be some sort of genetic component linked to the sex chromosomes relating to what one looks for in a mate.

If men tend to look for physical factors in their mates, it would make sense that gay men, without needing to accommodate females in selecting their mates, would be more directly interested in the physical aspects of their mates even than straight men, at least initially. This idea is supported by the somewhat visually based roles that gay men have taken on in society and the media. While gay men do exist in nearly every profession imaginable, there are marked concentrations of gay men in professions that directly and indirectly deal with the visual. Gay men have stereotypically been thought to dominate fields that involve creating spectacle (artists, costumers, and performers for example) and fields that involve the bettering of people’s physical experience
(hairdressers, clothing designers, and interior decorators). The link between the eye, masculine attraction and physicality is most assuredly reinforced by the most classical stereotypes of men, regardless of their sexuality.

What is even more interesting in the exploration of how homosexuality fits into the evolutionary explanation of attraction is where masculine and feminine roles fit into a long term same sex relationship, apart from the overarching masculine and feminine basic attraction patterns that seem to be prevalent in initial same sex attraction. Although some gay couples have a classical femme/butch division of responsibilities, many homosexual couples do not. Even if they do not divide the responsibilities strictly along masculine (or hunter/gather) and feminine (nurturer/homemaker/stability seeker) lines, they do find a balance that encompasses all of the necessities of a healthy relationship. Although, to my knowledge, very little exploration of this topic has been made in a scientific capacity, this would be an interesting subject to study further in terms of the division of roles and the influence of evolution, mating preferences and genetic survival.

Despite all of the advances in gender equality and the acceptance of homosexual relationships, perhaps the last thing to be said may be summed up as “the more things change, the more they stay the same.” Maureen Dowd, the noted editorial columnist for the New York Times, in a column titled “Dressed to Distract,” recently reported on the case of Debrahlee Lorenzana a young mother and apparently especially curvaceous and attractive employee of Citicorp who was fired by the bank for dressing too sexily in turtlenecks and pencil skirts. Even though many other female employees wore similar clothing, her curves were distracting to the unharnessed libidos of her male coworkers, so as to prevent or inhibit their abilities to do their jobs. In other words, these “hunter/gatherer” men were so overcome with their mating urges towards this attractive, sexy, fertile young woman, they were unable to work. She is suing Citicorp for wrongful termination, but the idea of men having a biological imperative that they are somewhat helpless to resist is central to the case.

To conclude, the search for the perfect mate is understandably complicated, but is, in many ways, biologically guided. Although there are many variations and many confounding, confusing factors that make every romance unique, the basic, underlying urges connected to successfully passing on one’s genes seems to be the unifying factor, at least in initial attraction.

Despite different cultural concepts of beauty, men, gay and straight seem to hunt for the most vibrantly young, fertile and healthy mate as their biology signals that these partners will have the highest chance of helping their genes pass on (even with gay men when classical reproduction is impossible). Despite the varied signifiers of strength, status, and future stability in cultures
all over the world, women, both gay and straight seem to be bent on finding mates that will keep them safe and create a future where they can easily reproduce and raise their children. Men and women the world over seem to make stupid choices and seem somewhat helpless to resist their biological imperatives, whether through masculine overemphasis on physicality as demonstrated in Maureen Down’s column in the New York Times, or by lesbians rushing prematurely into committed relationships as two female stability seeking imperatives double up on each other.

Rachel Clark-Spear is the youngest of four children. She and her siblings grew up in a small town in Connecticut. The children were homeschooled by their mother, Amy, and father, Walter, up until attending public high school. Rachel cherishes her childhood haunted house and its rustic charm, which she attributes much of the formation of her creativity to. Though Rachel is currently a Freshman at UCLA and adores the Hollywood glamour, she still maintains her small-town ideals and a great appreciation for nature.

References


Why Multiple Relationships?

Vanessa Marin

Different cultures have different views of how a woman and a man should be in a relationship. Some believe in their polygamous ways in which they can have as many wives as they want or they simply accept the fact that people have many sexual relationships. This is customary for them and seen as the norm and a high status mark in some communities. In Africa, the Kipsigis women that live in Kenya, must accept the polygamous ways or promiscuous ways of their partners (Borgerhoff et al 2009). In other areas, like in the United States, humans have resorted to monogamous ways. These new ways have become the legal way to take part in a committed relationship. However, the qualities of relationships that people carry out are shifting to more casual. Men look for more open relationships; therefore, there are more bachelors and bachelorettes in society. There is no marriage and they are totally free to wonder out and “test the waters.” This casual relationship of no true attachment is due to different reasons in women and men. The type of relationship one has varies in individuals, but men have more obvious reasons for which it can be deduced that some, if not most men, are more interested in maintaining numerous amounts of relationships. With this perspective in mind, men have not much interest in the quality of relationships they carry with their partner, but rather selfish reasons for doing so. This can easily be seen in many T.V. shows. There is always that one cheating friend or that promiscuous man. In “How I Met Your Mother,” there is character named Barney Stinson who is very promiscuous. He is a great representation of the men who enjoy multiple and casual relationships, but hesitate in actually committing to only one partner in a long lasting relationship. Casual relationships and non-committed relationships have been predominantly common in men; however, some women also have taken part in similar actions that reflect that in the end, women and men are both driven by self interest to engage in some type of relationship.
An attractive person typically knows when he or she is good looking. Men use this to their advantage to attract attention from women. In addition to the attractive physical features that they may have, there is the material attractiveness that some women seek because it represents success. Even though women know that there are men that do not seek a serious relationship as they do, they still have the hope of changing them and being the one woman who will change his promiscuous ways into a dedicated man that can share a relationship with her. Generally, women will select a man based on their positive attributes: good looks, good “parent” qualities, and overall, men that appear to carry “good genes” (Gangestad, et al. 2000). Kipsigis women in Kenya select the man that is more successful in terms of land. Whoever offers her the largest land, she will select. These women make these decisions because they need to ensure their survival and that of her future offspring (Borgerhoff et., al 2009). A good amount of men carry features and personality traits that women like. These men know that they are attractive, have material possessions, and play the role of “Mr. Successful” just to get the women’s attention. A study showed that undergraduate men in the United States were likely to lie and pretend they had all the qualities that make them successful that would make a women think that they were actually successful men (Borgerhoff et., al 2009). Acting as so gives them their infamous nickname—the Womanizer.

One may ask how is it that women are so attracted to men that happen to be womanizers. It is the good qualities that the male carries that leads the women to these men. Whether he is attractive or successful in society and at work, women seek good qualities. These qualities reinforce that he has characteristics of a provider and possibly a good father. Darwin’s idea of mate choice and reproduction doesn’t often follow through. Occasionally, women believe that even though the man is a womanizer, she can be the one to change this man into a committed man and make him the father of her children. Sure men seek multiple women, but since they are not actually reproducing, then there is no point to the mate competition within men (Miller et., al). It is a failed idea in this context. Darwin’s survival of the fittest idea allows the “good genes” of these men to be passed down, but since they are not often reproducing because of contraceptives, Darwin’s last step of evolution does not happen. Women that seek a committed relationship and have an encounter with non-committed men are wasting their time on them. This is because they are putting on hold Darwin’s idea of mate choice and competition.

Through the many years of human life, men have hunted large game and made an effort to be more successful, so that they can get women to sleep with them. Like in the early years, males would use meat as a bribing point to get women interested. It didn’t even have to be a serious commitment. They just hunted for more meat to get more sex. The Ach men were very
successful hunters; therefore, they were also very successful in having sex with the women (Ridley 91). Compared to our close relatives, the chimpanzees, they only approach a female chimpanzee when she is ready to mate. Just like human females will try to mate with the man with the best attributes, the chimpanzee girls also allow the most worthy chimp to mate with her. The chimpanzee ends up leaving her and moving on to the next chimpanzee girl that is ready to mate. He has no emotional attachment or commitment with any female. Chimp males are very aggressive towards the female chimps. They use this behavior of theirs to mate with them (Muller 2006). Here the male chimpanzees resemble the human male womanizers.

Another excuse men use to justify their relationships with multiple partners, men use the fact that that there is a difference in the amygdala between women and men. This part of the brain is located in the frontal lobe. Its function is to process memory and emotional reactions as well. The amygdala in women is larger than in men. Since it is much smaller in men, men don’t store up as much emotional reactions as women. This can be why women are more jealous if their partner is physically disloyal. They can be more disloyal because “men are generally more interested in and responsive to sexual arousing stimuli than women are” (Hamann et., al 2004). In order to conclude this, Hamann and colleagues used functional magnetic resonance imaging to see how the amygdala and hypothalamus reacted. They were active in both, but stronger and obvious in men. Also, men in relationships lack as much emotional reactions and are more prone to going off with other women to have many other relationships and not worry about becoming emotionally attached. The emotional function of the amygdala refers back to the jealousy humans feel. Men, even though they have a smaller one, are more jealous of physical natures their partner is involved in. Men care more about the physical infidelity of their partner. In contrast, women are generally more jealous to emotional infidelity (Cann et., al 2001). This can be what actually leads men to not committing and them focusing on quantity of relationships, rather than the quality of them. They aren’t building an emotional attachment, they are more physical beings.

Even though there are many women being victims of Womanizers, there are also groups of women that take advantage of the Womanizers. It has become a two way street where women have caught on and know that some men are not serious and they indulge in that to benefit from it in non-reproductive ways. To some, sex has become merely a pleasurable thing that helps some work their way to the top or to simply benefit. There is self interest behind this, and it is remarkable to see that it is being experienced by both males and females. It is surprising that women also take part and some even refrain from their natural ways of becoming emotionally attached (Cann et., al 2009). Men do it for the pleasure and excitement, while women with other intentions, that
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don’t include reproducing, do it for their own success. These women want to
network, create more friendships, and even replace their current mate that
does not carry her desired characteristics (Borgerhoff et., al 2009). If these
motives are true, then it is merely selfish of the individual. No one thinks
of the other person’s feelings. It has become a relationship that is lacking
commitment, and thus, it isn’t a quality relationship that can benefit both of
them on a serious level.

The once societal norm, specifically in the United States, of typically having
a serious relationship and carrying out emotions is something that is desired
by many, but achieved by few. This is more specific to women, because they
naturally become more emotionally attached (Cann., et al. 2001). In this
context, there is often a loser. There are win-win situations where the woman
might also be seeking a short term relationship; just for the fun of it. However,
for the numerous women that want that one man for themselves cannot obtain
it though men that do not have the same idea in mind. The entire point
in males wanting numerous amounts of women is to have sex with them.
This is when the win-lose event arises as a result of sexual conflict. There
is a problem in that, men are benefiting from this through pleasure and no
attachment, while the woman is victim and usually unaware that the man
will eventually leave her (Borgerhoff., et al. 2009). In committed and non-
committed relationships, Borgerhoff explains that the individuals in who have
better characteristics and therefore more capable of competing with people
their own gender, are the winners.

Being promiscuous is not typically seen as morally right or just in society, but
there are always those people that try to justify their actions. For this reason,
women that are looking for a serious relationship fear that they will be a victim
of men that are simply seeking pleasure. It is important to note that gender
has resulted in different attachment levels, especially when it comes to having
sex. Researcher, Vincent Egan argues that “males typically place less emphasis
on emotional attachment for sexual relationships, have a greater desire for
anonymous sexual encounters, and desire a greater number of sexual partners
than females” (Egan et., al 2004). In an observation, Egan and Angus had 29
males and 55 females answer questions based on infidelity, age, sex, sexual
preference, and marital status. Anyone who cheated on their partner would
get a score. The more they cheated, the higher it was. Then they measured
their infidelity to see if the cheating actions were physically or emotionally
driven .Men that did seek short term relationship will not care whether or
not a woman has characteristics of a mother. They don’t search for parental
characteristics like women do (Egan et., al 2003). The difference in women’s
and men’s motives shows that women are more interested in the commitment
part because they want to reproduce and pass on their genes. Furthermore
to this, the man that she is looking for has to be a reliable partner that can
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help provide and raise the child. Egan adds that since men have a higher desire to mate, they will want to be more promiscuous. He states it can lead to social failure (Egan 2003). Male’s promiscuity leads to a lack of a quality relationship because all effort is being put into the many relationships, that not one single one is getting full effort, and will not result in reproducing. Infidelity is much more common in males than females. Egan and Angus noted that both women and men cheat in relationships, but that women are careful and picky about whom they have an affair with. This observation suggests that men, being so open to mating, don’t really care who they have sex with, as long as they have an opportunity to have sex.

Both men and women experience feelings of lust once in a while. Men much more often experience this feeling than women do. Lust or libido, refers to wanting sexual pleasure and evolved in effort to seek sexual union. All in all, it is an effort to get humans to create an emotional attachment (Fisher 1998). The estrogen, androgens, and testosterone play a large part in this. The more you have of testosterone, the more sexual desires you will have (Fisher 1998). In addition to this, humans, both female and male, it is natural to desire sex from others, even if they are not emotionally attached. This is surprising because women usually are more emotionally attached. The nature of lust, and if one has more testosterone is what causes more sexual desires (Fisher 1998). Lust, presently, contributes to having more mates and doesn’t even help evolution because typically these relationships don’t result in offspring. Men also want to have offspring, but they can have sex without responsibility with the use of contraceptives. They don’t reproduce and they don’t commit to a relationship. Overall, lust has become an encouragement to seek multiple partners, not just one to share an emotional state with.

Having multiple relationships is learned from the media and has increased its popularity lately. Nelly Furtado’s “Promiscuous Girl” and “Maneater” both did pretty good worldwide, and they talk about multiple relationships while making it sound completely appropriate. There are many songs out there, and mostly recently released songs, that include lyrics that talk about being promiscuous and having multiple affairs with people, with or without a real relationship. Young adults and teenagers are highly attracted to these songs because of the beat, but sometimes are unaware of the actual lyrics behind the song. The lyrical meaning behind many of the songs are a strong motivation to people to carry out multiple relationships because it is much easier and fun than an actual committed one. If young adults are being trained as this, they will grow up just the same, and take part in what the lyrics are saying. This has nothing to do with the quality of relationships people experience. It is, for these individuals motivated by the lyrics, the idea of having a numerous amount relationships that attracts them. These songs are often about men being the promiscuous ones, and they are really reaching
out to a good number or men. There are some songs about women acting this way too, but not as many as men. It is these songs that have an effect in the behavior of an individual and create that group of men and women that become promiscuous to the extent where they are more concerned in the quantity of relationships and not the quality of them.

In this present day environment that motivates promiscuity through music, there is also the film industry that carries out T.V. shows and movies that have characters that are not the type to involve in a committed long lasting relationship and are more open to having multiple relationships, even with random women and/or men. It is much more common to turn on the T.V. and find a male character that engages in multiple relationships. Here in these T.V. shows, these men are often portrayed as “manly” and “cool” because they have many one night stands and if anything, short term relationships. Barney Stinson is a great of example of this behavior. The recent high rise of more and more non-committed men and women are slightly motivated even more by the environment that they are in. If the media has many characters that are engaged in multiple relationships, then the person interested in many relationships can easily justify it because it is what he or she has learned from T.V.

Some men and women have diverted from the more traditional single partner relationships onto multiple relationships with various people. Although it is much more common in men, women also take part in actions like this. In some cases, the non-committed relationship turns out to be a win-lose situation where one individual wants commitment and the other doesn’t. Here is where men are often stereotyped as unable to commit to a single relationship and work on the quality of it. In other cases, there is the win-win scenario, where both the man and woman are completely comfortable with having many relationships and not have a stabilized, long lasting one. Behind the action of having multiple relationships and not quality ones, is always self interest. There is no possible way in which a person will engage in an affair and not have selfish reasons. Even when it comes to non-committed relationships, men and women both seek something out of it. Men typically do it for fun, pleasure, and the idea that they can be with whoever they want and not have to worry about the length of the relationship. There isn’t a true emotional experience for them in this situation. Women, often if engaged in this activity, will gain not only pleasure, but most importantly, possible success in the market world. It is less common in women to have these experiences than men because they do have higher chances of becoming more emotionally attached because it is in their nature to do so.

Vanessa Marin and I was born and raised in Los Angeles, CA. After spending my entire life here, I have grown to love this city of LA. I enjoy
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playing lacrosse, dancing, cooking, and shopping. I am very friendly and sometimes too trusting of others. I really should work on not being so gullible. I am undeclared but plan on either majoring in Communications or Psychology. I commute to school so sometimes is gets pretty stressing with all the traffic. My typical weekend includes food, friends, and family. I am the oldest of three children so I spend a lot of my time looking after my little brother and sister.

References


Part V

Good and Evil
Captain John H. Miller as a Model of Pro-Social Behavior

Josh Neale

Steven Spielberg’s Academy Award-winning film *Saving Private Ryan* is renowned for its opening scene that presents a powerful portrayal of the Normandy Landings. In this scene, the film illustrates the brutal reality of combat through the graphic intensity of the Allied assault on the Omaha Beachhead. Spielberg accurately depicts the massive losses that the Allied forces experienced during the D-Day invasion on June 6, 1944. Among the total Allied causalities, which were estimated at approximately ten thousand, are three of the four brothers of the Ryan family. Meanwhile, somewhere in Normandy, the fourth brother, Private James Francis Ryan of Baker Company, is missing in action. Through a series of coincidental communications, United States General George Marshall is informed of the situation abroad and recognizes the overwhelming loss that their mother faces. General Marshall draws the parallel between the devastating situation that the Ryan family faces and Abraham Lincoln’s highly regarded letter to Mrs. Bixby. As did Abraham Lincoln in November 1864 during the American Civil War, Marshall acknowledged how “weak and fruitless must be any word of mine which should attempt to beguile you from the grief of a loss so overwhelming. But I cannot refrain from tendering you the consolation that may be found in the thanks of the Republic they died to save” (Lincoln 1864). Explaining the need for intervention to his staff, General Marshall took action that would later be recognized through the Department of Defense Directive 1315.15 “Special Separation Policies for Survivorship” or the Sole Survivor Policy. As one of the fortunate American soldiers that survived the Normandy invasion on June 6, 1944, Captain John H. Miller, the commanding officer of Charlie Company, Second Ranger Battalion, receives orders from General George Marshall to locate Private James
Francis Ryan and order him home immediately. Captain Miller assembles his company and embarks on a mission to locate and evacuate Private Ryan. Although the film’s scenario involving the Ryan is fictional, Robert Rodat’s script was inspired by the real life case of the Niland Brothers in which the Sole Survivor Policy was enacted in a similar manner. The four Niland Brothers served during World War II with only two of the four brothers surviving the war and completing their service.

Despite the fictional nature of the film, the actions of U.S. General George Marshall, Captain John H. Miller, and the soldiers of Charlie Company demonstrate the power of human altruism within the context of a plausible situation. Captain Miller, in particular, is an exemplary model of pro-social behavior. His decision to put both his life and the lives of his soldiers on the line in attempt to locate Private James Ryan and remove him from the field of battle is an example of extreme altruistic behavior that is exclusively demonstrated by humans. Such human altruism extends much further beyond any observed altruism in natural environments (Fehr 2003). While the argument could be made that Captain Miller and the soldiers of Charlie Company were merely following orders, the reality of the situation was that each soldier retained individual free-will and the ability to desert the mission. Private Reiben explicitly makes this clear when, at one point during the film, he reveals his intention to walk away from both his squad and the mission. During their military service, Captain Miller and his squad struggle to understand when one life is more important than another. Even though this broader question of the value of life that Speilberg grapples with throughout Saving Private Ryan is never fully answered, the actions of Captain H. Miller provide us with a thought-provoking insight into human altruism. While the soldiers in Charlie Company complain about the mission, Captain Miller’s altruistic drive strengthens his firm resolve as he leads his soldiers to locate Private Ryan. In the course of entertaining a discussion of Captain Miller as a model of pro-social behavior, the motivations behind his altruistic actions become an intriguing topic of scientific discourse that speak to a broader dialogue regarding human altruism. Within the human species, a certain tendency has been observed towards pro-social generosity regardless of whether or not the recipient is related to the donor (Fehr 2003). Captain Miller’s concern in relation to the safety of Private Ryan and his empathy for the loss that the Ryan family faced demonstrates a specific instance of this pro-social human tendency. This paper critically analyzes the various theories that seek to explain human altruism and examines their explanatory power with regards to both the example of Captain John H. Miller’s actions and other manifestations of human altruism. As will be demonstrated through examples, a single comprehensive theory does not explain the intricacies of altruism. Instead, by analyzing pro-social behavior from alternate and even conflicting perspectives this paper illustrates a clearer picture of the motivations behind human altruism.
Pro-social behavior involves actions which demonstrate that an individual cares about the welfare of others, feels concern for those around him or her, and more generally acts in ways that provide benefit to other members of society. The purist manifestations of pro-social behavior are free from a hidden selfish motive that is concealed behind a facade of good intentions. Such pure forms of pro-social behavior are motivated by altruism, an unselfish interest in providing assistance to another individual (Sanstock 2007). Thus, to investigate the origins of pro-social behavior within our society we must examine altruistic behavior.

The driving forces behind altruistic behavior within the human species have long been a subject of scientific inquiry. While the term altruism carries with it certain connotations, altruistic behavior can be specifically defined as the interaction between two unrelated organisms in which the organism performing the behavior experiences a detrimental effect as a result of providing a benefit to another organism (Trivers 1971). In Saving Private Ryan, Captain John Miller’s actions precisely demonstrate altruism as defined by Robert L. Trivers. Captain Miller leads Charlie Company on a dangerous mission that has a detrimental effect for the organism performing the behavior. For Miller and his soldiers, this detrimental effect is most apparent in the immediate danger that the mission presents to their physical bodies. Private James Francis Ryan, completely unrelated to any member of Charlie Company, receives an enormous benefit as a result of the actions of Captain Miller and his soldiers; Ryan is ultimately located and safely returned home from France.

In attempt to explain certain instances of altruistic behavior, Robert L. Trivers postulated the theory of reciprocal altruism and provided a mechanism for the evolution of such reciprocity. Trivers carefully differentiates between reciprocal altruism and explanations of altruism from the perspective of natural selection. A natural selection explanation of behavior which appears altruistic is, in reality, describing actions that are selfishly motivated by the genetic relationship between organisms. Trivers describes such behavior with the term “kin selection” and argues that such explanations, when generalized as a model to explain altruistic behavior comprehensively, “take the altruism out of altruism” (Trivers 1971). Kin selection explains the actions of a parent who jumps into a river to save his or her child from drowning as a selfish preservation of the genetic investment that the parent contributed to his or her child. On the other hand, if the two individuals are not genetically related then the behavior can be denoted as altruistic. The characteristic case of the drowning man or child provides a convenient framework in which to analyze certain classes of behavior that are characterized as altruistic. Examining the scenario of the drowning man as an isolated incident, the altruistic actions of the individual saving the drowning man are nonsensical. The theory of reciprocal altruism, however, requires that the situation is examined with con-
sideration of the possibly for future reciprocation. Trivers highlights that, as long as cooperation is maintained, the reciprocation of the drowning man in a reverse situation would result in net benefit for each individual regardless of the fitness cost associated with the altruistic action.

The fundamental problem intertwined with maintaining cooperation to achieve a common good is the temptation of defection that is eloquently expressed by the prisoner’s dilemma. The classic model of this fundamental problem in game theory is articulated through the example of two suspects that have been arrested by the police. Without enough evidence to convict either suspect, each individual in custody is offered the chance to defect and give evidence against the other. If one suspect defects and the other cooperates then the individual who defected receives no sentence while the individual who cooperated receives the full ten year sentence. If both individuals cooperate they each receive a minimum sentence. On the other hand, if both suspects defect then each receives the standard five year sentence. The rational decision, assuming that each suspect or player is concerned only with maximizing the individual benefit, results in both players defecting. Regardless of whether or not the other player chooses to defect, the individual will always receive greater benefit to himself or herself by choosing to defect (Kuhn 1997).

In the example Trivers provides of reciprocal altruism, the drowning man is involved in a form of the prisoner’s dilemma game. Defecting, in this case, is the failure of the drowning man to reciprocate the actions of the altruist that saved his or her life. Furthermore, the drowning man will maximize his individual benefit by defecting. Trivers acknowledges that “selection would seem to favor being saved from drowning without endangering oneself by reciprocating” (Trivers 1971). Nevertheless, a mechanism exists that may allow selection to act against the individual who defects. The evolution of reciprocal altruism may be facilitated if the altruist responds to the individual who defects and fails to reciprocate by restricting the target of altruistic actions to only those that cooperate. In this manner, the individual who defects is no longer eligible to receive the benefits of altruistic actions. If it is assumed that the fitness benefit of these absent altruistic actions is greater than the cost of reciprocating, then individual who defects will experience a net decrease in his relative fitness in relation to cooperative individuals. Trivers argues that there are three possibilities that lead to the emergence of altruistic behavior within the human species: “(1) the altruists dispense their altruism randomly throughout the population; (2) they dispense it nonrandomly by regarding their degree of genetic relationship with possible recipients; or (3) they dispense it nonrandomly by regarding the altruistic tendencies of possible recipients” (Trivers 1971). Through the dispensation of altruism via one of these mechanisms, genes associated with altruistic tendencies propagated throughout the human species and gave rise to the uniquely high degree of
altruism we observe in contemporary society. In the process of dispersing altruistic acts throughout the population, altruistic individuals allow for natural selection to discriminate against those who do not reciprocate. Individuals who defect thus experience decreased fitness relative to those that manage to maintain cooperation despite the prisoner’s dilemma. From an evolutionary perspective, the theory of reciprocal altruism argues that acts of altruism are motivated by the expectation of reciprocation. In this light, altruism is viewed as a means of cooperating to achieve common good, which in this case is increased group fitness.

Reciprocal altruism, however, cannot explain the entire picture nor is it a comprehensive theory that maintains explanatory power for the entire spectrum of altruistic actions. Rather, the theory of reciprocal altruism can only be applied to a specific subset of the forms of behavior that are denoted as altruistic. Reciprocity is simply one means of obtaining a return on an altruistic investment. Captain John Miller’s altruistic actions towards Private Ryan are clearly motivated by an interest that does not involve reciprocation. The altruistic actions of Captain Miller in Saving Private Ryan reflect a human propensity for generosity even when repeat interaction is improbable (Gintis et al. 2003). Given the nature of the circumstances, it is highly unlikely that Captain Miller will benefit from his altruistic actions as a result of direct reciprocity. Clearly, not all altruistic actions are motivated by the prospect of reciprocation. In conditions where direct reciprocity is absent, there must be an alternate mechanism that functions to maintain generosity.

Evidence drawn from ultimatum, public good, and dictator game experiments conducted in fifteen small scale societies suggests that experimental subjects will sacrifice personal cost to reward cooperation and punish selfish behavior (Henrich et al. 2001). The ultimatum, public good, and dictator game are all variations of common economic experiments. In the ultimatum game two players interact with one another in order to determine how to divide a specific sum of money between themselves. The first player or the donor decides how much to offer to the recipient. The recipient can then decide whether to accept or reject the offer. If the recipient accepts, the donor receives the original sum of money less the offered amount. On the other hand, if the recipient rejects, both players receive nothing. In the public good game, players are instructed to contribute an arbitrary amount to a common pool. They are informed that the common pool will later be expanded by the experimenter and then redistributed to all players. The dictator game is similar to the ultimatum game in the sense that a sum of money is distributed among two players. However, in this variant, the second player is passive and simply receives the amount of money that the first player offers. Henrich found that, across cultural and economic barriers, the results of all three games demonstrated a willingness of subjects to “share resources and undertake costly re-
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on a proximate level, the results indicate emotional signals that prompt subjects to reward altruistic behavior and punish selfish behavior. Moreover, this behavior demonstrates that, across societal and cultural boundaries, the altruistic individual is rewarded while those with a predisposition to defect are ostracized from society and thus pay a long-term cost for their behavior. On an ultimate level, the behavior functions as an evolutionary process that allows for the proliferation of pro-social behavior throughout a population. The proliferation of pro-social behavior via this behavior bears similarities to the mechanism that enabled the evolution of reciprocal altruism. However, the evidence of this behavior allows for specific conclusions to be drawn regarding the function of reputation in motivating altruistic behavior.

According to Pat Barclay, in certain situations where individuals are highly unlikely to receive direct benefits from their altruistic actions, the long-term benefits of a good reputation can explain the persistence of altruistic behavior (Barclay 2004). Such long-term reputational benefits result from both indirect and competitive altruism. As Henrick established, the behavior of individuals who reward altruistic tendencies and punish failure to cooperate forms the foundation of reputational benefits. Furthermore, the example of Captain Miller demonstrates that direct reciprocity is unable to account for all altruistic acts. Nevertheless, it is entirely possible that Captain Miller stands to benefit from the positive influence that his altruistic actions bore on his reputation. Theories of indirect reciprocity argue that individuals have a habit of providing increased benefits to people who have a history of altruism or a good reputation of cooperation. Essentially, in indirect reciprocity, the reciprocating behavior takes place through the actions of someone who is not the original recipient of the altruistic behavior (Alexander 1987). Although it is implausible that Private Ryan will be able to reciprocate the altruistic actions of Captain Miller, it is indeed likely that Captain Miller may receive reciprocation from other individuals in society. Supposing that Miller had managed to survive the battlefields of World War II, he would return to the United States with a prestigious reputation in society that would confer a multitude of fitness benefits. Regardless of whether or not another individual indirectly reciprocated Miller’s altruistic actions, the complex set of societal interactions that would benefit Captain Miller as a result of his altruism are an excellent example of generalized reciprocity. Robert Trivers describes generalized reciprocity as the multifaceted interaction of both reputation and social status that results in members of a social group continually being assessed according to their social interactions (Trivers 1971). With his return to the United States, Captain Miller would experience generalized reciprocity in the process of being honored as a veteran and a war hero.

Reimbursements from indirect and generalized reciprocity are not the only
means by which an altruistic investment may be repaid. In social interactions, people often find themselves engaged in relationships that require a certain degree of trust in order to function properly. Individuals, such as Captain Miller, with good reputational standing as a result of altruistic behavior benefit from competitive altruism when forming cooperative partnerships that are founded on trust. In certain situations, evidence demonstrates that humans are more willing to trust altruistic individuals than nonaltruistic individuals. Participants in a public goods game were tested in groups of four in an attempt to build reputation based on the degree of altruism that each individual subject displayed. After five rounds of the public goods game, all participants played a trust game involving the same group of four players. Each player was given a sum of money and was required to decide which of the other three players to send any amount of money to. The amount of money sent to the receiving player was then tripled by the experimenter. After receiving the tripled amount, the recipient was then required to decide how much money to return to the sender. Contributions to the public good game were higher when participants engaged in the trust game afterwards thus indicating that people display increased degrees of altruism when they can benefit from their resulting reputation. Furthermore, by analyzing the decisions of individuals in the trust game, the study concluded that people were more likely to trust altruistic individuals (Barclay 2004). Undoubtedly, the altruistic actions of Captain Miller in Saving Private Ryan resulted in others perceiving him as a more trustworthy individual. The reputational benefits associated with altruistic actions are a strong motivator for many altruistic actions that we observe in society, particularly in the case of Captain Miller.

Captain John H. Miller is an excellent example of an altruistic individual that challenges that traditional theory of direct reciprocity. In the process of critically analyzing the theory of direct reciprocity as developed by Robert L. Trivers with regards to its inability to explain the actions of Captain Miller, the inextricable connection of reputation and altruism is unmistakably demonstrated. The concepts of indirect reciprocity, generalized reciprocity, and competitive altruism cultivate a broader understanding of the motivations behind altruistic behavior. Saving Private Ryan demonstrates that the intricate complexities of altruism require a multi-perspective analysis of the behavior.

Josh Neale was born in New Zealand and moved as a young child to Pasadena, California where he would grow up and eventually attend the University of California, Los Angeles. As a true kiwi, Josh developed an interest in outdoor sports from a young age. Throughout his youth he spent countless hours both sailing on the shores of Long Beach and mountain biking the Sierra Nevada. His attachment to nature fostered an interest in the sciences which he continues to pursue to this day in his studies.
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Short. Fat. Mean. Offensive. Selfish. Doesn’t sound like the type of person you would want as a best friend. Unfortunately for Stan, Kyle, and Kenny, Eric Cartman from the Comedy Central television show South Park is the leader of their group of friends. Most episodes feature a new diabolical scheme designed by Cartman in which the fourth-graders of South Park, Colorado find themselves in a heap of trouble due to the outrageous extent Cartman will go to get his way. Apathetic to the feelings of others, offensive to the beliefs of others, and spiteful to the successes of others, Cartman’s decision-making motivation stems from his pretentious tendencies to always favor selfish actions. In behavioral game theory Cartman could be considered the “rational fool,” a term coined by Amartya Sen. The rational fool is someone who is only concerned with self-interested gratification in a short-term period. Thus, given the opportunity to take a profit now or take a higher profit later, the rational fool will choose an immediate profit now (Sen, 1977). Using game theory, I can determine whether or not Cartman’s behavior as a rational fool is analogous to real world human behavior.

Game theory is the study of the interaction between people—their strategies and the outcomes that result from their actions. A game is comprised of the players’ strategies and the rules that dictate how players will choose their strategies, the information available during each decision, and the preferences of each player’s outcomes based on the outcome’s utility factor (Camerer, 2003). In other words, a game is a model that depicts a social interaction in which one person’s behavior affects the outcomes of others. The most widely studied game in game theory is the Prisoner’s Dilemma. While the game cannot determine why players in the game make the decisions they do,
it does help illustrate the fundamental methods of how game theory works. Therefore, to ascertain if humans are purely self-interested, affected by the actions of others or somewhere in between, I will analyze the ultimatum game and dictator game as well.

Episode 99 of *South Park* illustrates the Prisoner’s Dilemma when Kyle and Cartman are being investigated by the principal for toilet papering their art teacher’s house. Cartman and Kyle can either tell the truth (Confess) or keep their mouths shut (Don’t Confess). Assigning utility values to the boys’ preferences facilitates the explanation of a game because it allows game theorists to analyze the desirability of different outcomes. If both boys confess they will receive a utility of 1. If both boys do not confess they will receive a utility of 3. If one confesses and the other does not, then the boy who confessed will receive a utility of 5 and the boy who did not confess will receive a utility of 0. Cartman and Kyle are being questioned separately and will not know the other’s decision. If both boys do what is best for them—confess—then both receive a payoff of 1. However, if they trust each other, the boys can cooperate and both not confess which will result in a higher payoff of 3 for both of them. Thus, the game is a dilemma because in real world scenarios most people choose to confess resulting in a lower payoff for both players when they both could be receiving a higher payoff if they did not confess (Nemeth, 2010). Although Cartman is self-interested and therefore succumbs to the Prisoner’s Dilemma every time, real human behaviors are not so fixed. The ultimatum game and the dictator game provide data about human behavior that suggests Cartman’s fictional character traits are not very indicative of how real people behave.

Using Cartman and Kyle to demonstrate how the game is played, the ultimatum game provides a model of human behavior that indicates that people are not always self-interested. Imagine that Cartman’s teacher gives Cartman (the Allocator) ten $1 bills on the condition that he has to make Kyle (the Responder) an offer between $0–$10. Kyle has the opportunity to accept or reject the offer. If Kyle accepts the offer, then Kyle receives the money offered and Cartman keeps the rest, but if Kyle rejects the offer then both players leave with nothing. Normative behavior—how players should behave—of the ultimatum game is as follows: if both players are self-interested, then Kyle should take any offer greater than $0 because a payoff of $1 is still better than nothing (Thaler, 1988). Also behaving self-interestedly, Cartman should expect Kyle to take any positive offer and therefore Cartman should only offer $1 to maximize his own payoff. In fact, Cartman does display normative behavior in this case because he is a self-interested fictional character, and as the Allocator in the ultimatum game, he would indeed offer Kyle $1. However, descriptive behavior—how players actually behave—demonstrates that Kyle, like most people in the experiment, would reject the offer because he feels Cartman is
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being unfair. Kyle’s rejection of a positive payoff is known as “other-regarding preferences” because Kyle is not simply interested in his own payoff, he is also concerned that Cartman’s payoff is too high (Levine, 2010). In reality, experimental data indicates that 75% of the Allocators typically offer 25-50% of the fixed amount with the median offer of 40-50% and the mean offer of 30-40%. The Recipient on average rejects offers below 20% of the fixed amount half the time (Camerer, 2003). Hence, the ultimatum game implies that humans are more than simply self-interested; they are concerned about the outcomes of others’ decisions.

Moreover, how the Allocator and the Responder behave indicates that reasons beyond self-interest affect human behavior. When discussing human behavior during games, it is important to understand the difference between assumptions about the psychology of the players and their strategic actions. For example, it is strategic—if we assume humans are self-interested—for a Responder to accept any positive offer; yet, while 50% of the Responders who do accept an offer below 20% of the fixed amount are acting in their self-interest, the other half who reject low offers exhibit an emotional response to the unfairness of the Allocator (Camerer, 2003). Furthermore, the Allocator’s normative behavior is to offer the lowest positive amount approaching zero, but descriptive behavior as the data suggests does not follow the normative behavior. The common psychological explanation for the descriptive behavior of the Allocator is reciprocity. Allocators generally choose to offer an amount close to an even split, because if the roles were switched, they would expect the other player to reciprocate and offer close to half as well (Ridley, 1996).

Economists often avoid providing psychological assumptions about players in a game due to the complexity and uncertainty surrounding different explanations. Although they may hypothesize about psychological explanations for behavior, economists’ work predominately deals with analyzing only the behavior in various circumstances. For instance, while the Allocator may be concerned with reciprocity, data from the dictator game indicates that the Allocator is more concerned about being rejected in the ultimate game (Levine, 1998). The dictator game is the same as the ultimatum game with one exception: the Responder cannot reject the offer. The game is very simple; the Allocator can offer any percent of the total amount and the Responder has to take the offer. Normative behavior dictates the Allocator should maximize his profit and offer nothing. Nonetheless, when allocating $10, only 21% of the Allocators in the dictator game actually offer zero and 21% offer an even split, thus the dictator game as well implies that humans are not purely self-interested (Forsythe et al, 1994). A greater percent of Allocators offer close to an even split in the ultimatum game than in the dictator game which suggests that without the fear of rejection from the Responder, Allocators on average will offer less in the dictator game but most will still offer a positive amount.
Upon further analysis, the dictator game demonstrates that after playing the ultimatum game first, the Allocator is in fact concerned with both reciprocity and fear of rejection. Offering a positive amount in the dictator game suggests the Allocator would want to receive a positive amount if the roles were switched, and the fact that the offer decreases from the ultimatum game to the dictator game implies the Allocator no longer fears rejection.

Given the data of the ultimatum game and the dictator game, it seems as though Cartman is an economist’s favorite experiment subject. His fixed, selfish behavior compels him to play the games as normative behavior advocates. Yet if the data shows that most humans do not behave like Cartman, why do economists ignore the psychology of players in a game and simply assume all players are self-interested? While trends describing human behavior do occur within cultures, economists avoid generalizing about why players behave the way they do. Even so, for game theory to be applicable economists must make assumptions that allow them to derive models of human behavior. Therefore, in order to establish a baseline of behavior, economists assume players will act in their own self-interest (Rabin, 1993). Once the foundation has been set, they can compare and draw conclusions using the standard self-interested player as the common model for all games.

Next, I will expand upon economists’ data from the ultimatum game and dictator game to evaluate the main psychological explanations for the difference between normative behavior and descriptive behavior. Cartman represents an ideal model for normative behavior that economists standardize because his only motivation in games is self-interest. Humans, on the other hand, are much more complex. Because every human is unique and may have a different approach to games, I will only discuss the main psychological explanations for descriptive behavior of the ultimatum game and the dictator game.

Reciprocity, the notion that humans will respond to a person’s positive or negative action with a similar positive or negative action, motivates people to play games with positive intentions towards others’ outcomes in order to initiate a positive response from the other player (Forsythe, 1994). For example, if Cartman and Kyle repeatedly play the ultimatum game and reverse roles each time, Cartman would always play self-interestedly and Kyle would reciprocate Cartman’s negative actions by playing self-interestedly as well leaving both players with minimal profits. However, reciprocity in real experiments tends to influence players to allocate close to an even split in the ultimatum game. The consensus among those attempting to explain human behavior in experimental games favors the perception that reciprocity on a wider scale is the expression of fairness—the aversion to inequality. Responders in the ultimatum game are willing to put a price on how unfair they feel the Allocator
is being (Camerer, 2003). For example, Kyle would reject an offer of $1 out of $10 from Cartman thereby accepting a loss of $1 to express his emotional response to unfairness.

Fairness is a player’s aversion to inequity in a game and is usually motivated by the selfish tendency to only care about the player’s personal payoffs relative to the other player’s payoffs. Reciprocity’s role then becomes to decide whether players will continue to play fair or unfair in multiple games. People’s tendencies in repeated games are to reward fairness and punish unfairness (Rabin, 1993). Another method of evaluating fairness in the ultimatum game is to measure a Responder’s minimum acceptance offer—the Responder’s “price tag” on fairness (Camerer, 2003). Data indicates that 30% of Responders demanded at least a third of the total amount and another 30% insisted on a quarter of the total amount (Fehr, 1999). Responders rejected offers lower than the minimum acceptance offer consequently punishing Allocators for being unfair. Interestingly, during repeated ultimatum games Responders rejected low offers less and less possibly for their motivation to punish unfair offers waned as the games continued.

Furthermore, to directly analyze the effects of fairness on a game instead of making conjectures about whether or not a player is motivated by fairness, I will dissect the classic Battle of the Sexes game. Cartman and Kyle want to go somewhere together but cannot decide where. Cartman prefers to go to Casa Bonita and Kyle prefers to go to the park. Both players would rather be together than go to separate venues; however, they make their decisions simultaneously. Cartman and Kyle’s payoffs for going to their preferred destination are 2X and their payoff for going together but not to their preferred destination is X. If they wind up at different locations they will both receive a payoff of zero (Rabin, 1993). The normative behavior results in two Nash Equilibriums—outcomes in which neither player wants to deviate from their decision. Both players would be satisfied going to either location just as long as they go together. The problem with the Battle of the Sexes games is deciding which destination they will go to together. Factoring fairness into the game, each player is now concerned with the beliefs of the other player. Hence, if Cartman thinks Kyle will go to Casa Bonita then Cartman believes Kyle is being helpful, and Cartman will also go to Casa Bonita to maximize both their profits. Likewise, Kyle will do the same if he thinks Cartman will go to the park. On the other hand, if Cartman thinks Kyle will go to the park, then Cartman believes Kyle is being harmful, and Cartman will go to Casa Bonita resulting in a payoff of zero for both. Subsequently, fairness drives both players to attempt to make assumptions about what the other player will do resulting in the assumption that the other player will most likely not play the strategy best for the first player. Thus, arriving at different locations—the descriptive behavior of the Battle of the Sexes game—becomes equilibrium.
due to the effects of fairness on the game (Rabin, 1993).

The aforementioned games serve as a model for how humans behave in different social interactions. But the analysis means nothing unless it can be applied to real world interactions. The latter part of the twentieth century saw an exponential increase in the amount of laboratory experiments conducted about economic principles; whereas before the 1960s, there were none (Levitt, 2007). Economist Steven Levitt is an outspoken opponent to human behavioral studies in the lab. Levitt argues that while physical science labs can be generalized to real world applications since the laws of physics do not change from the lab to the real world, economic labs that deal with human behavior cannot be extrapolated to apply beyond the lab experiment. There are countless factors that influence the behavior of human decision making, but the main factors can be condensed into five categories: morals and ethics, influence of other’s judgment, the conditions of the experiment, voluntary subjects, and the risk involved in the experiment (Levitt, 2007).

Morality plays a significant role on human behavior in the lab and in the real world, but does it affect behavior the same in both situations? In an experiment involving the exchange of money, like the dictator game, subjects in a lab typically display moral behavior based on the context of how the experiment is set up. When the subject is asked how much money he would allocate without ever seeing the other player, he offers nothing because the subject typically thinks the other player does not exist. However, if other people are watching the subject, he will often make the moral decision to allocate more due to the pressures of social norms and the influence of maintaining a good reputation. In the real world, nonetheless, monetary encounters cannot be controlled for. For example, organizations asking pedestrians to give money to charity on a crowded street attempt to make people think about the reputational consequences of others observing the person decline giving money to charity. While in a lab, experimenters can control for the effect of scrutiny of others on decision making; in situations like these, it is unknown whether or not scrutiny plays a role in the pedestrian’s decision. Maybe the person frequently gives to a specific charity that he trusts and does not know whether the organization on the street actually benefits a charity or is a scam.

Furthermore, lab experiments are often conducted in a way that would not occur beyond the experiment. Experimenters often research subject’s behavior when the subject is told his decisions are anonymous. In the real world, however, people’s decisions and actions are rarely anonymous; therefore, when the conditions of an experiment involve anonymity, subjects often do not believe their actions are truly anonymous. Researchers will use anonymity to control for the influence of scrutiny in games like the ultimatum game and dictator game and then submit their results as conclusive without accounting for the
assumption that subjects actually think they are anonymous. Moreover, due to ethical restrictions on experiments done in the lab, most experiments are conducted with voluntary subjects. Trends pertaining to the character traits and qualities of subjects tend to occur among those who self-select into the experiment. Consequently, when behavioral games are analyzed using voluntary subjects, the demography of the group is too similar to generalize the results. Levitt challenges lab results claiming that economists apply results to real world behavior without taking into consideration the biasing effects of experiments done in a lab.

Clearly, analyzing human behavior is as complex as human behavior itself. While game theory provides a model to generalize behaviors in various social interactions, the field is limited in its ability to reveal the full extent of the intricate psychology of the human mind. Games like the dictator game and ultimatum game attempt to show the relationship between behaviors and outcomes in different situations. Economists are mainly concerned with this relationship and tend to not pursue the psychological explanation of the behavior they study. Although economists do develop hypotheses concerning the basic assumptions of why subjects behave the way they do, the rule of thumb for behavioral game theory is to assume people are self-interested. Thus, Eric Cartman epitomizes the normative behavior of games as the rational fool, but his selfish behavior is not indicative of most human behavior. As demonstrated in the ultimatum game and the dictator game, humans are not purely self-interested. Even though these games are typically conducted in a lab which Levitt argues contains a variety of biases associated with how people behave in a lab compared to how they behave in the real world, results can provide very broad conclusions about human behavior. Granted the field of behavioral game theory is still in its infancy relative to other social sciences, its practical application to other fields like political science and economics make game theory a versatile discipline that will continue expanding as more social scientists research human behavior.
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Scapegoat or Murder Simulator: A Study on Violent Video Games and How They Influence Aggression

Evan Frisicia

With the introduction of the first home video game console in 1972, video games began to slowly infiltrate the culture of the developed world. Since their creation, games more deeply immerse the player, due to the introduction of advanced graphical capabilities and intuitive control methods. These games allow people to disassociate themselves from the world and immerse themselves in worlds of fantasy and wonder. With the introduction of improved graphics, video game developers now have the ability to realistically depict murder, assault and torture—actions that very well can impact an individual’s propensity to commit violent acts. Simplistic games like Pacman and Pong, which were prevalent in the 1970s and 1980s, have been replaced by complicated and graphically violent war simulators like SOCOM and Call of Duty. Scientists are now interested in whether or not these highly realistic video games are influencing how individuals act in the real world.

Scientific studies which have investigated the impact violent video games on gamers’ aggression have yielded either weak or inconclusive results. But, video games are not the only media source in which violence is prevalent as for decades there have been violent movies and television programs. While
some studies suggest that violent video games have more of an impact on a person than other violent visual media, e.g. Fischer et al (2010), not enough studies have been done in this field for a definitive conclusion to have been reached. Some scientific studies have demonstrated that people who are more prone to violent behavior are more likely to play violent video games; so now scientists are unsure if violent video games encourage aggressive behavior or if inherently aggressive people are naturally attracted to violent video games. Another possibility is that violent video games may have a cathartic affect on gamers because they help relieve stress. While recent studies suggest that violent video games may have a cathartic affect, this result occurs in a small proportion of the population. However, the scientific community has been unable to reach a consensus as to the impact violent video games have on behavior. Recent evidence suggests that if violent video games have any effect on behavior, the proportion is small.

Aggressive behavior, in the context of the paper, is defined as any unprovoked act of violence or verbal aggression. An act of violence, while it may not be the most productive way to deal with a situation, is a normal response when someone is being harassed or antagonized. I am interested in unprovoked acts of violence because I want to see if violent video games can cause a marked change in an individual’s behavior pattern. If violent video games cause a person to act violently without any provocation, it would suggest that violent video games act as the impetus for aggressive behavior. The type of aggression that will be the focus of discussion for this paper will be direct aggression whose definition, outlined in Anderson and Carnagey (2004) is an act of aggression committed in the presence of the victim, as opposed to indirect violent behavior, defined as actions committed away from the victim like theft or lying. I have chosen to focus the paper on this type of aggression since the majority of people are most concerned with the effect violent video games can have on a person’s propensity to commit violent acts. Critics primarily target games like Grand Theft Auto, Manhunt, and Call of Duty, all of which deal in violence. While there may be some effect of violent video games on indirect aggression, this essay will focus on effects of direct aggression.

Video games are not the only source of media where a large amount of violence occurs, as movies and television have had violent images for decades. If video games are as negative an influence as some politicians claim, then violent video games would cause a higher spike in aggressive tendencies than violent television programs and violent movies. This is not to say that movies and television shows do not affect the levels of aggression in a person, as Berkowitz et al. (1963) found that there was a noticeable increase in the amount of aggressive tendencies the audience harbored. Berkowitz et al. (1963) administered a standard intelligence test to a group of individu-
als. To half of the participants the individual administering the test acted condescendingly, while to the other group the test administrator acted neutrally. The participants’ blood pressure was monitored before and after the intelligence test. Next, half of the provoked group and unprovoked group were exposed to a 7 minute clip of an action movie, while the other half watched a 7 minute documentary on the creation of the English canal system. The results demonstrated that regardless of whether the participant had been provoked before watching the aggressive clip, his blood pressure would skyrocket. Also, regardless of whether or not the participant had been provoked before watching the canal documentary, their blood pressure was quite low, well below the blood pressure of the action movie group. However, this experiment’s results somewhat conflict with some modern studies as Berowitz et al. (1963) predicted that violent media would increase the likelihood of violent attacks while by Ferguson et al. (2010) has found that there seems to be no causal link between bullying and violent media. Since there are some conflicting conclusions in these studies, there does not seem to be a definitive answer as to how violent media affects people.

The main argument for why video games might have a higher propensity to cause aggressive tendencies would be that in a video game a person is actually controlling their character, which familiarizes the individual with committing violent acts. Recent studies comparing the impact of violent television programs and movies to violent videogames seem to support this argument. An experience done by Fischer et al. (2010) found that an individual’s aggressive tendencies increased when he or she was playing a game that allowed him to customize his character. Fischer et al. (2010) had two groups of individuals, one group playing the boxing simulator in the video game *Wii Sports* and the other group playing the bowling simulator in the video game *Wii Sports*. The groups were further divided, as half of the participants in both the bowling and boxing groups played with a generic character, the other half played with a character they customized themselves. After playing the game, participants were asked to administer an amount of hot sauce, which was to be consumed by an unknown person. Participants were allowed to taste the hot sauce before administering it, and were told that 87% of individuals disliked the taste of the hot sauce. While the amount of hot sauce that was administered by both bowling groups was almost equal, those who had played the aggressive game, the boxing simulator, with the customized character, administered 8.84 grams of hot sauce while the participants who played the boxing simulator with a generic character administered 12.92 grams of hot sauce, a difference of around 33%. This level of personal involvement and interaction is not possible in television and movies, due to current technological constraints.

The amount of time a person spends playing a video game seems to affect his experience as well. The longer a person plays a violent video game, ac-
According to Ferguson (2009), the lower an individual’s aggression level will be. Ferguson (2009) researched this issue, and, based off a study by John Sherry, then postulated that the reason for this drop in aggression was that unfamiliarity with the game is what initially caused the aggression, and once the player had become accustomed to the game, the player’s level of frustration dropped. Unfamiliarity could lead to frustration if the player did not know the controls to the game or even the goal of the game. While it has been proposed that the increased familiarity with the game is the reason for this curious phenomenon, there are other possibilities of why a person could have his aggression levels drop. An alternative possibility that seems to be the most plausible is that a person gradually becomes desensitized to the violence in the game, so much so that he no longer feels any aggressive tendencies due to the violent imagery. If this is the reason for this drop in aggression levels, it would seem that it is possible to alter an individual’s behavior towards an event that initially stirred within him a violent reaction. This result would also seem to signal that aggression is a learned, rather than an inherent response. However, this is mere speculation, and further research on the subject would need to be conducted before this hypothesis could be discussed in earnest.

Since it appears that increased exposure affects the impact video games have on an individual, it is important to note that some scientists have found video games to be addicting. The results of scientific studies suggest that video games can be addicting. Video games have been observed to have addictive properties, as noted by Griffiths et al. (2004), who surveyed 550 random people who played the game Everquest. In the survey Griffiths asked each individual a multitude of questions including nationality, gender, education level, amount of time the individual spent playing Everquest and sacrifices made to play Everquest. While it seems as if the game is somewhat addictive, as the surveyed individuals older than nineteen played for 24.7 hours a week and the surveyed individuals who were nineteen years old and younger played 26.5 hours a week, the results demonstrate that the younger a player is, the more hours per week he plays. This study suggests that video games are able to ensnare and captivate minds, especially the minds of younger people. Grusser et al. (2007) looks at these phenomena as well, as the study tries to determine whether or not video game addiction was related to addiction. Grusser et al. (2007) surveyed 7,069 people online about their video game habits and how they affect their aggression. The survey’s found that 11.9% surveyed showed signs of video game addiction, while there was little correlation between video game addiction and aggression. While the proportion of gamers that were found to have an addiction was not very high, the fact that there was any presence of addiction at all, demonstrates that video game addiction is a real psychological condition. This ability to captivate an audience for a long period of time makes it seem all the more possible that video games, like other visual media
and even print media, could be used to manipulate an individual’s beliefs and ideologies. Since it seems that individuals play video games for long periods of time, it is important to note what effects long playing sessions have on the player’s experience.

Some studies suggest that an individual’s aggression decreases if the artificial intelligence in a game behaves like a human. Williams et al. (2002) studied this effect by having 56 individuals play a CD-Rom version of Monopoly, once against the computer and once against a human player. At certain intervals during each game, the players were asked to fill out a questionnaire which asked them to assess their mood. The results clearly demonstrated that a person was much less aggressive when he was playing a human player and much more aggressive when playing the computer. Williams suggests that by making the computer opponents seem more human, the levels of aggression and anger a person experiences would decrease. It seems that when the majority of people play a video game with others, they view their opponents and teammates as beings who lack humanity. Since they do not regard the people they interact with as human, they do not treat their opponents as they would, if they played the game face to face. However, as technology has progressed, games have been able to make human players in games seem more human. Williams et al. (2005) found that an exposure to online video games did not significantly increase a person’s propensity to commit real world violence. In Williams et al. (2005) a group of people were randomly assigned to play the game Everquest and record their play history in journals and answer questionnaires about their mood. The rest of the population was assigned as control group, who also filled out the same questionnaires that the Everquest players had received. After the data had been collected, the results showed no significant difference on the levels of aggression of the control group and the Everquest players. What is interesting to note, though, is that the game used in Williams et al. (2002) was a CD Rom version of Monopoly, a game devoid of any violence, while the game used in Williams et al. (2005) was Everquest, a game where the purpose is to kill various creatures and people. Higher levels of aggression were generated during Williams et al. (2002) than Williams et al. (2005). These studies suggest that if programmers are able to make computer opponents in games act like human players, then aggression levels might decrease. This would prevent people, especially younger children, from creating a negative habit where they become accustomed to acting hostile towards people.

Williams et al. (2002) demonstrated that other types of video games can cause an individual to act aggressively, and that all types of video games can cause an individual to develop aggressive tendencies. One such explanation for these phenomena would be that it is the competitive aspect of video games causes aggression, not the violence itself. Sports games would be a good type
Scapegoat or Murder Simulator

Evan Friscia

of game to test this hypothesis against, as while most competitive sports have some violence, they usually contain no blood and are not graphic in the violence that is committed in the game. By monitoring the levels of aggression in a person and by comparing the results to aggression levels when a person is engaged with a more graphically violent game, it is possible to determine if the level of violence has any impact on how much a person’s aggression levels are altered. What was ultimately found, by an experiment conducted in Anderson et al. Anderson and Carnagey (2009), was that the games that depicted large amounts of violence caused aggression levels to go much higher than the traditional sports games. Anderson and Carnagey (2009) had individuals play sports games with traditional rules and then had individuals play football and baseball games with gratuitous violence in them. Before playing and after playing each game, each test subject was asked to evaluate how angry they were on a scale from 1 to 5. The study found that when individuals were playing the games with gratuitous violence their levels of aggression were much higher than when they were playing the traditional sports game. This seems to negate the argument that violence, not competitiveness is what affects the amount of aggression a person feels. While video games do contain some violence, they are not the only media to do so.

While most studies seem to claim that violent video games have an impact on behavior, scientists disagree on the types of impacts they will have. Ferguson et al. (2010) discovered that there is no causal link between violent video games and either delinquency or bullying. In this study, 1,254 volunteer 7th and 8th graders were given a questionnaire that asked about the child’s interaction with their parents, extracurricular activities, time they spent playing video games and what their attitudes towards conflict were, in order to gauge how aggressive the subjects were before the experiment. In respect to the video game portion of the questionnaire, participants were asked to write down the games they had played most in the past six months and write down what rating the game had received from the ESRB. This study found that the children’s interactions with their parents and their inherent predisposition to aggression accurately predicted the child’s propensity to bully or be a delinquent. Conversely, interaction with violent video games did not have a significant impact on these behaviors.

It is possible that violent children seek out violent video games, which generates a correlation between game playing and violent behavior. If this is true, then why does it seem that some studies observe a relation between violence and violent video games? The experiment Bijvank et al. (2009) suggests that inherently violent people seek out violent video games. The studies had individuals read the descriptions of video games, and then rate them on a scale from 1 to 10, regarding how much they want to play the game. Each individual took to a survey to determine to what level each subject had a resistance
to violence reactance, trait aggressiveness, and sensation seeking. Those with higher levels of aggressive traits had a higher propensity to rate violent video games as a game they would like to play. Bijvank et al. (2009) asserts that an individual’s propensity to commit violent acts has nothing to do with the type of media the person consumes, as his inherent traits are what ultimately lead him to selecting his desired form of entertainment. This seems to suggest that violent video games do not cause people to become violent; they are just the preferred choice of entertainment of inherently violent people.

An individual’s genetics can also determine if violent video games are an effective stress relief tool for an individual. Some psychologists have proposed that violent video games are so popular because they provide an outlet for a person to express his aggression towards an inanimate source. The relief of stress through video games, known as the catharsis model, seems to be dependent on genetics as much as an individual’s susceptibility to aggression. Certain individuals are genetically predisposed, according to Ferguson et al. (2010), to picking the activity of playing a video game for the purpose of stress relief. While this individual is taking part in the same entertainment form as a person that is more susceptible to aggressive behavior, the individual who is playing the game for stress relief is doing so for an entirely different reason than the person who is naturally aggressive. This theory, known as the catharsis theory, has not been researched adequately; a fact strongly stated by Antonius (2004). Due to the lack of research it would be wise to reserve judgment on this manner until the theory has been thoroughly researched. With this in mind it is important to understand how much a person’s genetics really do influence a person’s propensity for aggressive tendencies. Although the majority of the evidence does not support the idea that the catharsis theory applies to the majority of the population, this does not mean that the theory holds no value.

There does not seem to be a definitive answer as to whether a person’s genetics or life experiences seem to have more of an impact on a person’s level of aggression: both do play a part on the development of an individual’s aggressive tendencies. Early research done in this field, like Hill (1970), supported this claim that neither nature nor nurture has more influence on the development of a person’s aggressive tendencies. Hill (1970) is a good representation of early nature verses nurture study, as the conclusion of Hill (1970) is entirely derived from scientific articles written around 1970, when this type of science was first becoming popular. It seems that either nature or nurture can have a greater impact on the development of a person’s aggressive tendencies, depending on the individual. In fact, as stated by Brown et al. (1982), a small imbalance of a person’s serotonin levels can drastically affect his propensity to act violently. This seems to suggest that a person’s biology affects the way he will develop how he acts aggressively and how he views aggression, as Brown
et al. (1982) attributes aggression and other traits to the levels of serotonin in an individual. However, this anomaly seems to only affect a small portion of the population, yet it serves as an example that there are some physiological characteristics that can affect a person’s propensity to adopt an aggressive demeanor. How an individual develops is determined by both his inherent susceptibility to violent media and his surroundings. Each factor varies on a case by case basis, so it is impossible to come up with one universal theory that can be applied to every individual.

While it would not be entirely accurate to assert that violent video games are the root cause for the rise of aggressive tendencies in adolescents, it would be reasonable to claim that if a child plays a violent video game, there is a chance that it could lead to the child developing aggressive tendencies. Even this claim is tenuous at best, as only a few modern studies have shown that it could be that. Currently, with the data available in the present, there seems to be no factual basis for the claim that violent video games foster aggressive behavior in those that would normally not be aggressive. The most compelling argument that the current studies indicate is that violent video games may increase the levels of aggression in people who are innately aggressive. But even this is a weak claim, as the US Census Bureau has found that the rate of violent crimes in the US has remained relatively stable from 1980 to 2007. Yet this does not mean that violent video games are beneficial to society and to those who play them, as the claim that violent video games can help reduce stress is just as dubious as the claim that violent video games cause the rapid increase in aggressive behavior. If anything, violent video games seem to affect only a small portion of players, as it seems only a small portion of the population is affected either positively or negatively by violent video games. Since video games are relatively new, their impact on a person’s mind has not been well studied, which initially led psychologists and politicians alike to speculate on the effect video games would have on a person. The assumption that emerged was that violent video games have a negative impact on a person’s mind, a statement that lacks any factual basis. Recently there has been a lot more research done on the influence of violent video games, and it seems as if they do not have a profound effect on the development of aggression. Violent video games may be influencing a small portion of the population, but it does not seem like they are having the drastic negative consequences that leaders of government think that they do.

Evan Friscia is (for now) a political science and history major at UCLA. His current residence is Napa, California where his house boarders a farm, a high school and a vineyard. Evan has been an avid video game player since he received a Gameboy for his 5th birthday. Due to Evan’s long-standing fascination with video games he was curious to see if video games actually did have an effect on the behavior of individuals. While
the issue remains unresolved, Evan hopes that one day we can accurately judge how much violent media affects individuals.

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Heroism Across Three Warrior Cultures in Comparison to the U.S.

FRANK HERRERA

Heroism is often defined as exhibiting the qualities of a hero: courage, bravery, fortitude, and unselfishness. More importantly however, heroism often pertains to exhibiting these qualities especially in battle. Moreover, the heroes of a society are often its warriors. Warriors are revered as heroes and are held in high esteem in society, and acts of heroism in extreme situations occur more frequently during times of war. But is there more than one type of hero? Are heroes simplistically homogenized or can heroes be multidimensional? Additionally, are the characteristics of a hero universal across different warrior cultures, or are there certain cultural factors that help shape a society’s idea of what it is to be a hero. One way anthropologists study different cultures is by studying the ethnography of the culture. This is research in which one learns about the particular group through observer immersion into the culture. This paper intends to investigate the ethnography of three warrior cultures: the Samburu, the Dani, the Yanomamo, and how the concept of heroism differs in comparison to the U.S.

The Samburu

The Samburu people of Kenya are a pastoral people who mainly herd cattle. The Samburu have an institution of moran, which refers to a heroic age group of young men who are proud, courageous, war-like and heir to the Samburu
tradition (Wasamba). Moran is used to describe young men who have entered into warrior-ship after circumcision, and whose main responsibility is to protect the community. The Samburu are a people who value elegance and courage, but most esteemed is nkanyit—which refers to self-respect, and fearless defense of one’s honor, duty, and dignity. The moran ethos is meant to instill the values of nkanyit in young Samburu men. The Samburu way of life is centered around cattle keeping, and their society demands that they not only protect their cattle, but bring in more cattle from neighboring communities through raids. Because, the Samburu people believe that no other communities should own cattle since they were given to them by god, successful raids by morans are revered as acts of heroism. The Samburu community values the performance of narratives, or ngatini, because it provides, education, socialization, recreation and entertainment.

The institution of moran instills a bond of comradeship, in which they are supposed to stay together, eat together, raid together, and suffer together. They learn how to cooperate and share amongst their fellow morans. This ensures loyalty to the group. Morans are often seen as symbols of valor and elegance because of their appearance and behavior which are characterized by the red ochre-plaited hairstyle, bravado, springy-steps and heroic dance style of jumping high up amid intense heroic humming, which are valued by women and community members (Wasamba). Moranhood is understood by everyone in the community to be a period of health, freedom and fearlessness. Moreover, the Samburu people regard elderhood as a period where men lose their fine looks, their close fellowship and their freedom and view their physical decline in health with sorrow. This is why the Samburu people value the youthful period where men are morans. Because, the morans are held in such high esteem within the Samburu community, they are free to do as they please without any objection from the elders. They are free to conduct raids on neighboring communities and are at liberty to have permissive sex with young girls, but are not allowed to marry these girls.

The Samburu moran ethos celebrates exceptional degrees of courage, strength, perseverance, self sacrifice and agility exhibited by warriors. They also make moranism relevant to the tasks assigned to morans by the society such as herding cattle, protecting the society from enemies, raiding other communities for wealth and training as cultural ambassadors and future elders of the community. This explains why moran characters in Samburu oral narratives are, in many cases, depicted as heroes (Wasambu).
The Dani

The Dugum Dani of the West New Guinea highlands are a typical stone age culture which had stone axes and adzes, intensive fallow-cycle sweet potato agriculture, domestic pigs and dogs, and settled villages. Dani society is characterized by territorial political groups of about a thousand people loosely united into alliances of about a thousand people. Before government pacification programs became effective during the 1960’s, warfare consisting of announced battles alternating with surprise raids, existed between some alliances (Heider). In April 1961, most of the Dugum Dani men used stone tools; by December 1963, all men had iron tools and only rarely used stone tools. The history of archaeology tells us that the replacement of stone tools by metal tools has a revolutionary effect on the culture. Advancements in technology result in drastic changes in a culture. However, the introduction of metal tools into the Dani culture resulted in no significant change in the Dani culture (Heider). Even though the Dani were exposed to improved weaponry, they did not take advantage of the new technology and continued to live their leisured lives as if the metal tools were stone. Heider goes on to suggest that this could be explained in that the special circumstances of Dani life allow so much leisure anyway that an increase in tool efficiency by itself has little significance. We assume metal tools allow more efficient use of time and energy. According to Heider’s studies, Dani work habits were too lax to effectively measure the efficiency of stone tool usage.

The Dani are constantly at war, but the Dani seem to view their life as relatively peaceful, and seem to emphasize agriculture. When asked the question, “What do people do?” the 60 Dani respondents consisting of young girls, younger boys and older boys the overall responses were about food production and food preparation in Dani society. However, it seems that at the time of the study, warfare had officially ended for nine years, which would account for depressed war-related responses. The Dani children’s responses approximately reflect the relative amount of time spent in subsistence activities compared with conflict and ritual (Heider). In fact, most of the Dani’s time consists entirely of sitting around, resting, talking, perhaps smoking a cigarette made of home-grown tobacco, or doing some minor handicraft task. Heider describes the Dani sexuality as a “low energy system,” consisting of a bland and nonclimaxing nature of Dani activity, as well as a general lack of high emotional engagement in interpersonal relations. The Dani see themselves, or define their own lives, not in terms of war and ritual, but in terms of the routine activities of gardening and cooking.

Szalay and Maday in 1973, studied United States students on the subject of “verbal associations on the analysis of subjective culture”; they asked 50 stu-
dent of each culture living in the Washington, D.C., area to list 25 important domains of life. The differences between the Dani and the United States students’ responses were quite different. In the U.S. student priority list, the first four involve domains of positive affect and interpersonal relations such as love, friendship, sex and family, as well as the eighth and ninth which were marriage and people. In contrast, of all 453 of the first 10 Dani responses, only five qualify for any of these domains.

The Yanomamo

The Yanomamo indians of South America, located in the rainforests of Brazil and Venezuela, have until recently, managed to maintain their native pattern of warfare and political integrity without interference from the outside world because of their isolation. The Yanomamo live in small tribes and much of their daily lives consists of gardening, hunting, gathering, making crafts, and socializing. These small tribes put their men in high esteem, and their chiefs are men who are held responsible for the knowledge and safety of the group—especially their women. Since they are a polygamist society, conflicts among tribes are frequently caused over women or sexual issues which frequently lead to violence.

The Yanomamo political alliances are largely based upon kinship. They have developed a complex feasting and trading system as a result. The Yanomamo live in a constant state of warfare with neighboring rival tribes and even within their own tribe. In fact, at least one-fourth of all adult males die violently (Chagnon). Even peacemaking often requires the threat or actual use of force. Moreover, a major season that dominates their annual cycle is the dry season. The dry season is the time where the Yanomamo are able to visit other villages to feast, trade, and discuss politics with other allies (Chagnon). However, the dry season is also a time when raiders can travel and strike at their unsuspecting enemies.

Yanomamo men are labeled as unokai for having undergone a rite of purification after committing a murder of another human being. Men who are labeled as unokai were shown to have more wives and children than more milder Yanomamo men (Chagnon). This seems to suggest that the more that a Yanomamo man is constantly involved in warfare and battle, more reproduc-tively successful they are in their group. Yanomamo violence revolves around revenge. Furthermore, there are cultural rules that dictate what a proper revenge killing entails, which is accepted to be an equal exchange of homicides. For example, members of Tribe A raids Tribe B—they steal their women and in the process, kill five members from Tribe B. Their rules dictate that Tribe B
would have to exact revenge on Tribe A by killing five members from Tribe A. Heroism in the perspective of the Yanomamo people seems to be the willingness to face death in battle, especially to exact revenge on a rival tribe that has wronged his group.

U.S. Military

U.S. World War II combat veterans suggests leadership, loyalty, and risk-taking are three differentiating dimensions of combat-decorated heroism. Wansink et al. conducted a survey of 526 combat veterans from World War II, in which 83 received a medal for heroism for either of the following: rescue (such as saving a comrade at great personal risk), extra aggressiveness (such as single-handedly charging a pillbox), grenade situations (such as absorbing the full brunt of enemy firepower), rear defense (such as delaying or holding off the enemy while fellow soldiers escape), refusing medical aid (such as continuing to fight despite physical injury), and leadership (such as spontaneously taking command or showing leadership under extremely difficult circumstances). The results of the survey revealed that combat heroes exhibited strong levels of personality characteristics associated with leadership, loyalty, and risk-taking. Furthermore, eager heroes (those who were enlistees) exhibited higher levels of risk-taking, while reluctant heroes (those who were draftees) exhibited higher levels of loyalty (Wansink, Payne, van Ittersum). The results of this research done by Wansink, Payne and van Ittersum suggests the possibility of more than one type of hero. Heroes, may indeed, be multidimensional.

The Universality of Subjective Heroes

Based on the ethnographies of the Samburu, Dani, and Yanomamo warrior cultures, there seems to be an underlining theme of what it means to be a hero which is shared by the view of the U.S. These four societies agree that a hero is someone who protects the members of their society, even if it means sacrificing one’s own life. There is a sort of universal truth that heroism is exhibiting courage, bravery, fortitude, and unselfishness particularly in battle. Although there are universals to our concept of heroism, the studies of these warrior cultures also reveal a more subjective conception of heroism. Acts of heroism are shown to have cultural differences. The Samburu consider risking one’s life to steal a rival tribe’s cattle heroic. The Dani will go to war with an entire rival village, instead of fighting with a rival tribesman and consider this to be heroic. The Yanomamo value revenge, and consider dying for the sake of vengeance heroic. Moreover, what seems to hold true in all of these cultures is that there seems to be a double standard in the ethics of one’s actions. That is, the difference between in-group and out-group ethics. According to these warriors cultures, stealing from a rival tribesman (whether it be cattle, women, etc.) is justified and deemed an act of heroism, yet they criminalize stealing
from a member within their own community. This remains true in the U.S., and even in all groups of society. Thus, while the qualities of a hero seem to be matters of fact, acts of heroism are subjectively justified within their respective communities.

Ever the realist, Frank champions logic and reason, and has a strong desire to understand everything and everyone. Always the observer, he prefers listening to people talk rather than talking himself. He hopes to make a difference in this world however slight it may be. He strives to be all that he can be, and desires to live a life without regrets. But most of all, he simply wishes to be frank.

References


Sociopaths and Serial Killers: 
On how people become capable of committing selfish acts of violence without remorse

Keith Dore

Serial murder has existed all over the world since Locusta, the first acknowledged serial murderer, was publicly identified in Rome in AD 54 (Whitman and Akutagawa, 2004). In all likelihood, serial murder has probably occurred since before the Roman Empire existed. Yet popular culture has only recently become obsessed with the practice—ever since the exploits of the first well-known serial murderer, Jack the Ripper, were made public in London in the late 19th century. Since that time, serial killer thrillers have practically become a genre all their own, popularized by novelists like Stephen King, films like The Silence of the Lambs and Texas Chainsaw Massacre, and recently, television shows such as Criminal Minds. These influences have created for the public mind a sense that serial murder is somewhat of a common or growing phenomenon. However, serial murder actually comprises a very small portion of crimes, and even of murders, committed. Fox and Levin (2005) cite 558 active serial killers in operation in the US since 1900; of the pool of 4000–5000 homicides per year in the US where the motive is unknown, serial murderers are responsible for no more than 200 people per year. Despite the small number of serial murders given the large number of homicides in the nation, serial murder never ceases to fascinate people. The reason for this is that it is ex-
tremely difficult for the average person to understand how someone can take
the lives of multiple human beings, and then feel no remorse for his or her
actions. The fact that many killers also derive a sense of enjoyment from their
kills baffles normal people even further. Perhaps the most riveting aspect of
serial murder for people, besides the grotesque nature of the killings (serial
murders rarely consist of a short and sweet process), is the uncertainty of how
serial killers will act. Common myths surrounding serial murderers include
that they are loners, only motivated by sex, who travel all over to commit their
offenses (Lawson, 2009). In reality, there is not an archetypal serial killer who
embodies the entire profession. Serial murderers fall into different categories
and often have varying motivations. The common thread these murderers do
share is that virtually all of them are sociopaths. This paper will discuss the
factors that lead to sociopathy and serial murder. What distinguishes the man
that acts out his aggression by yelling at the television from the man that acts
out his aggression by murdering strangers? What biological factors, if any,
contribute to the behavioral processes of serial murderers?

There are several hypotheses for what causes a person to become a serial
killer. Some blame abusive or negligent parents for a child’s development
into a sociopath. Another explanation is that neurological differences in the
regions of the brain that control emotion and memory cause sociopathy. It
is also believed that there exist genetic predispositions to sociopathy. Yet an-
other hypothesis is that sociopathy is an evolutionary adaptation for cheaters
and freeloaders who live in cooperative societies. The most likely cause of
sociopathy is a combination of some of these factors. Serial killers are not
simply born mentally deranged monsters, nor are they entirely products of
poor parenting. People develop sociopathy as a result of genetic predispo-
sitions for neurological differences and antisocial behavior combined with,
traumatic childhood experiences. The serial killer is the sociopath that takes
the next step and makes a conscious decision to kill. That element of choice is
what distinguishes the sociopath from the sociopathic serial killer.

For all intensive purposes, the terms, sociopathy, psychopathy, and antisocial
personality disorder will be used synonymously in this paper. As Fox and
Levin (2005) point out, to psychiatrists, there are minute differences between
the terms, but the symptoms are similar enough to bunch them together as
one disorder for those who are not involved in the psychiatric profession. Ac-
cording to Lawson (2009), psychopathy is defined as “a personality disorder
manifested in people who use a mixture of charm, manipulation, intimidation,
and occasionally violence to control others, in order to satisfy their own
selfish needs.” Sociopaths only care about themselves and have trouble feeling
empathy and remorse. Sociopathic serial killers can therefore kill innocents
without any qualms.
This emotional inability to feel empathy or remorse is partially a result of abusive or negligent parenting. Authors, Whitman and Akutagawa (2004), argue in their paper that a child who is neglected by his mother is at high risk of developing antisocial and violent habits. They claim that a mother is supposed to provide her child with not only physical necessities such as nourishment and clothing, but with emotional comfort as well. A child’s first relationship is with his mother. This crucial relationship sets the tone for subsequent relationships in the child’s life. If the child does not experience love from his mother in the first few years of his life, then he will not develop in an emotionally healthy manner. It is very unlikely that the child will ever be able to fully develop emotionally, even later on in life, as the first few years of a child’s life is when essential emotional development occurs. The child will not expect love from others, nor will he be able to feel love for others. Instead he will feel unwanted and develop a strong sense of anxiety as a result of feeling unworthy of love and attention. Not finding the emotional gratification that he expects from his mother, the child then looks inward for the comfort that his mother does not give him. The child turns to masturbation and has violent sexual fantasies, which not only alleviate the anxieties and feel pleasurable for the child, but they grant the child a sense of control over his situation. He comes to associate comfort with autoeroticism and violence.

The anxieties of neglected children can be further alleviated through acts of outward violence. Sociopaths who become serial killers often exhibit violent behavior early on in their lives; they set fires and torture and kill animals (LaBrode 2007). These acts of violence, like autoerotic pleasures, give the child a sense of control over his environment which helps to alleviate the anxiety caused by feeling unwanted. This urge to control others never disappears for serial killers and is exhibited in their treatment of victims. Serial murderers generally select the most vulnerable of victims, allowing the murderer to exert his power over said victim. Murderers will torture victims before killing them, deriving pleasure from the victim’s helplessness and pain. Also, killers frequently engage in necrophilia, which allows them to feel complete control over the body of victims in both life and death.

An explanation for how negative childhood experiences influence sociopathic development is that trauma stumps neurological development in the brain, which in turn stymies emotional progress in the child. So the environment in which a child is raised has a profound effect on the biological development of the child. A number of interacting regions of the brain are impaired to some degree in sociopaths. Heide and Solomon (2006) discuss a number of these neurological deficiencies in their paper. They explain that the right hemisphere of the brain is responsible for information regarding emotion and social interaction. The right brain of a child does not develop normally when he is neglected or abused in the first few years of life. According to the au-
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thors, this abnormal development prevents the abused child from developing empathy. Without empathy, the child will struggle in relating to others and will have no issues with using other people in order to fulfill his own desires.

Furthermore, the corpus callosum is what connects the right hemisphere of the brain with the left hemisphere of the brain. People who were neglected as children have a 15-18% decrease in the size of their corpus callosum when compared to people unaffected by trauma. Without the interconnectedness of the right brain and the left brain, the emotions and rage of the right brain operate without being checked by the logic and reason of the left brain (Heide and Solomon, 2006). Sociopaths are therefore more susceptible to act violently when provoked by an outside stimulus.

Another part of the brain that Heide and Solomon (2006) claim is affected by childhood trauma is the limbic system, which consists of multiple regions of the brain and helps to regulate emotion, memory, and behavior. One element of the limbic system, the amygdala, helps with aversive conditioning and instrumental learning (LaBrode, 2007). These allow a person to learn by experience. According to LaBrode (2007), if a person does something wrong, he will receive an aversive response, and can therefore learn not to commit the act again. However, in people who were maltreated as children, the amygdala is 8-10% smaller than in those who experienced a normal childhood (Heide and Solomon, 2006). A traumatized child whose amygdala does not fully develop will not learn to avoid certain behaviors, such as violence, because they will not experience the aversive response that instructs them as to what is right and what is wrong. According to Heide and Solomon (2006), the amygdala also helps to assess experiences emotionally and to determine if a stressor poses a threat. If it determines that there is an imposing threat, then the amygdala signals other parts of the brain in order to respond to said threat. The reduced amygdala size in traumatized individuals can inhibit the amygdala’s ability to recognize danger and may therefore cause the amygdala to send signals that are unsuitable for responding to the situation at hand.

Another issue with the limbic system in traumatized individuals is the hippocampus. According to Heide and Solomon (2006), the hippocampus aids in the formation and retrieval of both verbal and emotional memories. The volume of the hippocampus is reduced in people who were abused as children. The amount to which the hippocampus is reduced corresponds to the amount and frequency of abuse that the child experienced. As a result, those who were traumatized have difficulty paying attention and remembering things. This may exacerbate the effects of the amygdala in not being able to learn what is socially considered to be right and wrong.

Yet another limbic system problem involves memories being retained in the limbic system permanently. Heide and Solomon (2006) state that normally,
memories are passed from the right limbic system to the left cerebral cortex where they are stored for the long run. Distressing memories stay in the right limbic system longer than normal memories, but are still eventually processed and transferred to the left cerebral cortex. In people who underwent childhood trauma, those distressing memories may never be processed. Heide and Solomon (2006) claim that the traumatic memories get stuck in the right limbic system, causing the individual to relive frightening aspects of the experience. Furthermore, the authors say that since the memory is not stored in a normal manner, the individual cannot use that memory to learn from the past experience. He is therefore more susceptible to act violently, or in otherwise ill-mannered ways.

One final effect Heide and Solomon (2006) state that trauma has on the limbic system is in the relationship between the higher cortical regions of the brain and limbic system responses. Early childhood trauma prevents full development of the neural circuits between the prefrontal cortex and the amygdala. During a stressful trigger, the response of the prefrontal cortex is decreased and prevented from checking the response of the amygdala. Consequently, the amygdala overreacts in its response to the trigger, no matter how trivial that trigger may be. This could be yet another reason why certain sociopaths are so quick to respond to stressors with violence.

All of these neurological changes are results of abusive or negligent relationships between parents and child. Indeed, many famous serial murderers underwent some type of trauma during their childhood. Jeffrey Dahmer’s mother was mentally ill and took drugs while pregnant with him (LaBrode, 2007). Henry Lee Lucas witnessed his mother having sex with other men and was forced by his mother to dress up like a girl. Ted Bundy’s mother was only a teenager when she had him, so Bundy grew up believing that his grandparents were his parents and that his mother was his sister. The traumatic events in these killers’ lives most likely inhibited the healthy development of their brains and surely contributed to their development of sociopathy. However, not all people who are traumatized in their youth grow up to become serial killers. Some people develop sociopathy, but derive their selfish satisfaction in ways that do not include killing. Fox and Levin (2005) state that some people who feel the need to exert control over others find their outlet in the business world by doing everything in their power to knock out the competition. Others who experience trauma in their childhoods do not develop sociopathy at all. Three time Rock and Roll Hall of Fame inductee, Eric Clapton, was born to a teenage mother who he grew up believing was his sister, just like Ted Bundy. Yet unlike the infamous Bundy, Clapton transcended his upbringing and went on to become one of the best guitarists of all time. Clearly, childhood experiences are not the only factor in the acquisition of sociopathy or in the development of a serial killer mentality. What else contributes to the
development of sociopathy?

One additional influence on sociopathic development is genetics. Heide and Solomon (2006) state that there are gene mutations that can cause an individual to have low serotonin concentrations. One of the mutations can lower a person’s serotonin level by 80%. The authors describe serotonin as a neurotransmitter that aids in regulating emotion. They say low levels of serotonin can cause aggression and an inability to regulate uncouth behavior. Men with a certain genetic mutation for low serotonin levels are at a higher risk for acting impulsively or violently if they were abused as children or if they consume alcohol (Heide and Solomon, 2006).

There are also genetic mutations that increase the likelihood of becoming sociopathic (Heide and Solomon, 2006). There is a gene that corresponds to decreased monoamine oxidase A (MAOA) activity. The authors state that for men with this gene who are also traumatized during childhood, there is an increased risk of developing antisocial tendencies. More interestingly, they claim that men with low MAOA activity are 3 times more likely to be convicted of a violent crime by the time they are 26 years old than a man who is also abused but has the gene for standard MAOA activity (Heide and Solomon, 2006). This is a critical statistic because it does not simply compare abused men to non-abused men. It is a distinction between abused men with the gene and abused men without the gene. Abused men are already much more likely to act violently than non-abused men for the emotional and neurological reasons discussed above. This indicates how large of an impact genetics can have in the development of a sociopath. This is not to say that genetics is the most important factor in the equation. As previously stated, sociopathic serial killers are not born deranged monsters who cannot help but kill. It is evident that early childhood environment also plays a key role, and that not all sociopaths have the gene for low MAOA. However, genetics can play an important role in sociopathic development.

One interesting genetic argument for why sociopathy developed was put forth by Harpending and Sobus in 1987. They claimed that sociopaths adapted over time as a way to live in a cooperative society without giving anything back. The authors essentially argue that since sociopaths are only self-interested, they do not give anything back and are defectors in the real life game of tit-for-tat. While this seems like a plausible explanation, I do not agree that it is why sociopathy developed. For one, the authors require that for a sociopath to be successful, he needs to be mobile so as not to get caught cheating in one environment. Some serial murderers, such as Ted Bundy, are very mobile and this argument might work if all serial murderers were the same. However, according to Fox and Levin (2005), 73% of serial killers commit their crimes in the same city or state. This negates the mobility argument and would make
it much more likely for serial killers to be caught if they were defecting in a
game of tit-for-tat. Furthermore, the authors do not seem to discuss how such
an adaptation could be heritable. The argument seems more speculative than
conclusive.

Aside from genetic and neurological arguments, sociopaths that become serial
killers murder strangers because they enjoy it. As a result of their antisocial
behavior and the abuse they suffered as children, sociopaths have no empathy
for others. They use whatever is available to them to satisfy their desires. If
that involves using another human being, then so be it. It makes no difference
in a sociopath’s mind. Not all sociopaths resort to killing in order to quench
their selfish thirst for gratification. The causes of sociopathy having been more
or less established, what causes a person to make the jump from sociopath to
serial murderer? There is no clear indication as to what causes this trans-
formation. Killers often experience a stressful trigger right before they begin
their string of murders (Whitman and Akutagawa, 2004). However, this in
itself is not a reason to kill strangers. Everyone experiences stressful events
in their lives, including sociopaths who choose not to kill. The only thing
that seems to logically explain why someone would resort to murder is the
element of choice. There are sociopaths who try their hand at murder, but
stop after one or two victims because they discover that they are not cut out
for the murdering profession (Fox and Levin, 2005). This indicates that there
is a degree of conscientiousness involved. Those who collect victims time and
time again, are making a choice to continue their murderous habits. Many
who do this derive a sick sense of satisfaction from killing. It is their release.
The satisfaction that a normal person feels from completing a project on time
is what many serial killers feel when they take another victim. They feel like
there is no other way for them to obtain the same feeling of fulfillment than
to kill. They feel no love for themselves or anyone else so they consider lives
to be expendable. They choose to kill because they can.

There is no one set avenue for becoming a serial killer. Childhood abuse at
an early age is a major factor in the development of sociopathy. Neurologi-
cal impairments as a result of childhood trauma expound on the emotional
detachment of the child. Furthermore genetic dispositions exist that can in-
crease the risk of developing antisocial habits. These factors all combine in
various proportions to affect sociopaths to varying degrees. The most impor-
tant element in making the leap from sociopath to serial killer is the one that
cannot really be explained: the fact that serial murderers have a choice and
they choose to murder seemingly because they can.

I am a nineteen year old freshman from Newark, California, which is in
the Bay Area. I am currently undeclared and have no idea where my col-
lege path will take me. I want to double major in history and psychology
with a minor in Spanish, but that plan may change soon enough. I want to study abroad my junior year and travel as much as I can throughout my life. I play club baseball at UCLA and enjoy competing in all sports. My hobbies include playing guitar, juggling, snowboarding, hiking, and camping. If I were a superhero, I would be Batman or Ironman because neither of these men have actual super powers, but both of them persevered through traumatic experiences and then engineered their own successful careers as heroes. My life motto is “Tough times never last. But tough people do,” which is a quote from Dr. Robert Schuller. I love my friends, I love my family, and I have a great life. I wish you the same.

References


Dr. Hannibal “The Cannibal” Lecter and Serial Killers: Does abuse beget violence?

Kenneth Carbajal

Mataviejitas. Literally means “The killer of elderly women.” A 48 year old woman referred to as JB was raised by an extremely aggressive alcoholic mother, did not attend school, was not allowed to go out, was reportedly traded away to an unfamiliar man at the age of twelve in exchange for three bottles of beer, and allegedly tied up and raped during her first night with him. This woman is now accused of killing at least twelve elderly women and attempting to kill another (Ostrosky-Solis, 2008). Mexican authorities have dubbed her the name of “Mataviejitas” and estimate the number of her victims range from twenty-four to forty-nine.

Among the most intriguing characters throughout the history of mankind have been murderers, more specifically, serial killers. A prime case of the public’s attraction to serial killers is the popularity of the fictional character Hannibal Lecter who in Silence of the Lambs reveals his sociopathic behavior and unsettling taste for human flesh. Although this is a hollywood-produced glorified version of a serial killer there are nevertheless many traits of Lecter’s that can be attributed to real life serial killers. Due to the disturbing and atrocious nature of their acts serial killers hold a distinctly frightening position in the minds of many humans. Part of the reason for this intrigue is the mystery behind their acts of murder. Serial killers perform murder in the most vicious ways and because of seemingly unreasonable causes. Examples of murders by serial killers are heinous and shocking. Learning of these types of acts drives a hole through our concept of basic human behavior, as naturally God-fearing,
law abiding, and ultimately concerned with the well being of others. How is it that some members of society can commit such horrid behavior? Why did they resort to this course of action? How can they repeatedly engage in these events without mental detriment inflicted onto their psyche? And, the question with perhaps the most fleeting of answers and the main focus of this paper: What is the cause of their abnormal mental state and behavior? The answers to these questions help clear the obscurity behind why serial killers repeatedly murder. The basic idea behind the argument of “Nature vs. Nurture” is that an individual’s environment early on in life negatively affects his development (nurture) or that an individual has a genetic deficiency that predisposes him to psychopathic behavior (nature). It is the purpose of this paper to explain that, although “Nature” undoubtedly plays an important role, the “Nurture” argument most effectively covers how and why serial killers frequently murder. As a result of their environment serial killers are often damaged both psychologically and neurologically. Abuse during childhood, brain dysfunction, and damage to the amygdala and orbital frontal cortex are all possible causes that lead serial killers to sociopathic behavior (Ostrosky-Solis, 2008).

Serial murder is defined as “the unlawful homicide of at least two people, carried out in a series over a period of time” (Encyclopedia Britannica). Note: this is different from mass murder which is regarded as several victims being murdered at the same time. In order for a murderer to be defined as a serial killer the following three elements must be present: (1) the number of victims must be at least three, (2) the killings must occur at different times and locations, and (3) the motivation for murder is either sexual or an internal psychological gratification (Kraemar et al., 2004). Prevalent characteristics of serial killers often include a psychopathic personality, a history of abuse during childhood, sexual sadism, and autism spectrum psychopathology (a complex developmental disability that causes problems with social interaction and communication). Also, Kraemar et al. claims that significant variability is seen concerning personal history, individual sexual interests, age, alcohol/substance abuse, ethnicity, gender, circumstances of the murders, and the victim’s distinctive characteristics among serial killer cases.

The term “serial killer” in itself is merely a way of categorizing a type of murderer and not a medical classification. Most serial killers suffer from Antisocial Personality Disorder (though not all who suffer from Antisocial Personality Disorder are serial killers) which the Diagnostic and Statistical Manual refers to as “...a pervasive pattern of disregard for, and violation of, the rights of others that begins in childhood or early adolescence and continues into adulthood” (DSM-IV). In the case of serial killers their disregard for the rights of others expresses itself through the carefully orchestrated murder of individuals. The DSM-IV states that to be diagnosed with Antisocial Personality
Disorder a person must have at least three of the following characteristics: 1. Failure to conform to social norms 2. Deceitfulness, manipulativeness 3. Impulsivity, failure to plan ahead 4. Irritability, aggressiveness 5. Reckless disregard for the safety of self or others 6. Consistent irresponsibility 7. Lack of remorse after having hurt, mistreated, or stolen from another person. As previously stated, a large number of serial killers suffer from Antisocial Personality Disorder but on deeper analysis are additionally labeled as sociopaths or psychopaths.

Elements of sociopaths and psychopaths are often intertwined with Antisocial Personality Disorder, features shared include: aggressive narcissism (which consists of glibness/superficial charm, a grandiose sense of self-worth, pathological lying, a cunning/manipulative nature, lack of remorse or guilt, shallow affect, callous/lack of empathy, and a failure to accept responsibility for own actions) and a socially deviant lifestyle (which includes need for stimulation/proneness to boredom, parasitic lifestyle, poor behavioral control, promiscuous sexual behavior, lack of realistic long-term goals, impulsivity, irresponsibility, juvenile delinquency, and early behavior problems) (PCL-R, 2003). Again, not all characteristics are required for an individual to be classified under one of these disorders. It is believed that psychopaths suffer from semantic and affective processing defects also, the cognitive emotional components of psychopaths are unstable and poorly integrated which leads to their shocking decision making (Kiehl, 1999).

In what ways the origins of the aforementioned disorders are genetically predisposed, develop due to environmental conditions, or most likely how they are a combination of both are an expression of the broadly applied concept of “Nature vs. Nurture.” Two prevailing arguments are, on the “Nature” side, that genetic conditions predispose individuals to characteristics that identify serial killers. On the “Nurture” side is the idea that a traumatizing event (or several events) mentally alters an individuals psyche thereby shaping the sociopathic behavior that leads them to become serial killers. As previously mentioned a combination of both the “Nature” and “Nurture” side of the argument affect the development of sociopathic behavior. However, as will be explained later on, it is apparent that the likeliest cause of the sociopathic behavior of serial killers is caused by events throughout life that aggregate to deteriorate the one time normal mental behavior of these people.

Kraemar et al. (2004) conducts a study of 157 serial killers which includes information comprised of age, race, and ethnicity of both offenders and their victims; the relationship of offenders to victims; reasons for the crimes; approach, event locations, body disposal; and other overall characteristics. Overall, the study found that in serial murder cases the offender is often a relatively young white male who targets strangers, usually women, for sexual reasons.
The offenders exhibit careful planning by moving the body of the victim from one location to another, using restraints on the victim, and disposing of the body in remote locations. Serial killers are also often “hands on” in their approach, usually killing through strangulation or beating with the hands or feet.

Evidence suggests that serial killers come from broken homes. In analyzing “Case Studies of Seven Serial Offenders” by James Beasley a significant variability among the seven offenders was discovered. The age of the offender when he/she first murdered ranged from sixteen to thirty two years old; four of the seven participants were diagnosed with a psychopathic personality; the prevalent motive behind the murder of their victims was classified as sexual satisfaction in four cases, in the other three profit/emotion seeking was the main force; four of the seven had a history of drug or alcohol abuse; and all offenders had a criminal history, four scoring “extensive” and the remaining three only “minimal.”

In the case studies “Offender number three” was a thirty two year old white male, never married, and lived a highly transient lifestyle. Important characteristics of his early life that can be taken as significant influences on his psychopathic transgressions include: his mother’s numerous marriages, two of which occurred while the offender was a child and lived with her; his mother’s alcoholism; his cold, distant relationship with her and little interaction; and his constant fights with his stepfather, who often beat him. At the age of seven he would often torture animals by “putting firecrackers up cats’ butts;” by age nine he was placed in a foster home for several months and by ten was convicted of truancy and burglary leading to his placement in a juvenile detention center. When asked of his offenses he spoke with a lack of empathy and remorse towards his victims, showed impulsivity in his acts, and a sense of grandiosity. These are all indicators of psychopathy.

“Offender number four” was a white male who was frequently verbally and physically abused by his father. He demonstrated belligerent behavior and low self-esteem in early childhood. He was given an honorable discharge after enrolling in the military for an “underlying immature personality” and had a very turbulent three year marriage during which in at least one instance he threatened his wife with a shotgun to the head. The divorce left him with an intense hatred of women. After this he led a very transient and nomadic lifestyle in which he committed many crimes including assault, rape, burglary, grand larceny, armed robbery, auto theft, and trespassing. As one of the few serial offenders who reflects the fictional character Hannibal Lecter this offender raped four of his female victims and mutilated their bodies through cutting, stabbing, biting, and evisceration. Also, he left his victims in positions that were characteristic of his murders. He would often leave his victims in
poses that were intended to taunt, shock, and offend those who found them.

“Offender number five” had a childhood marked by family instability, during which his mother divorced and remarried. He became associated with youth gangs that were involved in property crimes and assault; he was also arrested numerous times for burglary, assault, shoplifting, auto theft, trespassing, sex crimes, vandalism, disorderly conduct, and robbery. At an early age he murdered an elderly white woman, then served twenty five years in prison. Immediately after being released he began killing again. His murders were usually associated with white women and sexual assault. In his interview he admitted to strong feelings of isolation as a child, he often felt frustrated and would go off by himself to release his feelings, often having no interactions with other children. As he grew older he learned to associate sexual gratification with violence and found it difficult to experience sexual arousal without violence involved. In addition to this, he lived a parasitic lifestyle, lacked any remorse for his violent acts, was immensely manipulative, failed to accept responsibility for his actions, and showed little behavioral control. These are all signs that he was a psychopath.

“Offender Number Six” shows a possible cause of his sociopathic behavior may have been due to a mixture of environmental and developmental causes. He claims to have been verbally abused by his father and had learning difficulties growing up. Early on he suffered from a speech impediment and had an IQ of 68 which classified him as mentally deficient. In adolescence, he was isolated and stole form others. He also was involved in pyromania and animal cruelty which is believed to be a precursor to sociopathic behavior.

These cases show common themes, among them: highly unstable and complicated upbringing from early childhood to late adolescence; verbal and/or physical abuse; alcoholism involved in some form or other; divorce of parents and subsequent remarriage of one or both parents; feelings of isolation and social awkwardness as a child; the release of pent up feelings through abuse of animals; and a transient lifestyle later on in life. These themes show how a parasitic environment early on in life can mentally, psychologically, and emotional harm a child so severely that they find release later on in life through the murder of others. These ideas support the “Nurture” side of the argument by emphasizing that environmental factors greatly affect the development of serial killers and lead them to eventually kill. Some may contest that many thousands of people have similar upbringings and do not go down the same road as serial killers. Therefore “nurture” cannot be the singular explanation...right? Yes and no.

A difference between individuals who suffer abuse throughout childhood and do not become sociopaths and those who do become sociopaths is that the latter learns to deal and cope with painful disillusioning stimuli such as abuse.
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(Porter, 1996). This may seem like a strange explanation but Porter claims this leads serial killers to tune out emotions and carry out sociopathic behavior. Studies have shown that psychopaths show anticipatory heart rate acceleration and small electrodermal responses to aversive stimuli. This shows they, unlike individuals who suffer abuse yet do not develop sociopathic behavior, develop a coping response that allows them to tune out their brains negative interpretation of sociopathic behavior (i.e. rape, murder, etc.). A small number of tested psychopaths took longer to recognize emotional words than neutral words (Williamson, 1991). This was viewed as a “perceptual defense” against emotional stimuli which further shows the characteristic abused individuals with sociopathic behavior have that causes them to tune out emotional responses. The reason why some individuals cope differently than others emotionally and in turn become sociopaths is not certain. What is known is that “nurture” indeed influences this and it is possibly a very important distinction sociopaths have that separates them from other abused individuals.

Neurological dysfunctions linked to serial killing have been proposed, more specifically complex partial seizures are believed to greatly influence serial killing. These are results of “nurture” yet are not present in all victims of abuse. This is a critical difference between those who suffer abuse and become sociopaths and those who suffer abuse and remain relatively normal. The limbic system is a complex system of nerves and networks in the brain which includes the hippocampus, amygdala, anterior thalamic nuclei, and limbic cortex. The limbic system controls basic emotions (i.e. fear, pleasure, anger) and drives (i.e. hunger and sex). The odds of a limbic system dysfunction in serial killers, more precisely, a limbic psychotic trigger reaction, are much more likely than in the average individual (Pontius, 1993). This reaction possibly includes: (1) a transient psychosis (hallucinations and/or delusions), (2) autonomic hyperactivation (loss of bladder control, nausea, ejaculation), (3) motiveless, out of character, unplanned, and well remembered homicidal acts, (4) committed with a flat affect (not emotionally or impulsively provoked), (5) typically involving a stranger who happened to provide an objectively harmless and only subjectively important stimulus, and (6) an individualized stimulus that triggered a repeated memory revival of a painful experience (Pontius, 1993). Through simple observation one can see the correlation between the characteristics of this reaction and the behavior of serial killers, psychopaths, sociopaths, etc. Therefore it is worthwhile to explore the possibility that neurological damage leads serial killers to behave in murderous ways.

In the case previously presented concerning a woman who Mexican authorities refer to as Mataviejitas it was found that electrophysiological measures revealed alterations in affective processing and a dissociation between knowing how to behave and actually behaving in socially acceptable ways (Ostrosky-
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Solis, 2008). Two types of testing were administered to this woman: (1) Neuropsychological and Neuropsychiatric Assessment, and (2) Electrophysiological Studies. The studies suggest that this woman processed all stimuli (neutral, pleasant, and unpleasant) differently than other women relatively similar to her by not feeling emotionally affected by gruesome images. This supports the previously made claim that sociopaths do not process emotions the same as other individuals. Also, it has been discovered that criminal psychopaths show a significantly lower amount of activity related to affect in the amygdala/hippocampal formation, parahippocampal gyrus, ventral striatum, and the anterior and posterior cingulate gyri (Kiehl et al., 2001). In other words the limbic system, processing of memories, emotional responses, and emotional processing are inhibited. They also showed over activity in the bilateral frontal temporal cortex for processing affective stimuli. What can be taken away from these discoveries is that the affective abnormalities seen in psychopaths, sociopaths, and serial killers may be linked to faulty or ineffective input from the limbic system. These dysfunctions are a result of their environment and correspond with the “nurture” argument.

Overall, these findings show that serial killers are heavily influenced by events that occur in their childhood. Physical, verbal, and mental abuse are the leading causes of the abnormalities that develop later on in their lives. The conclusion that can be drawn from this data is that an abusive environment during childhood is very prevalent among serial killers and therefore can be attributed as a leading cause of sociopathic behavior. Although not all who experience abuse early on in life become serial killers it can be deduced that neurological deficiencies and the resulting lack of emotional response created by this abuse are what separate serial killers from other abused individuals. The “Nurture” side of the argument appears to be much more crucial to the explanation of why serial killers act out their sociopathic behavior than the “Nature” argument. Although it is ultimately the individuals choice to act out this behavior they lack remorse and effective emotional processing due to their upbringing and experienced abuse.

I am a Political Science major and have spent my entire life in Los Angeles. I one day plan on being a prosecutor to do my part to bring about justice in society. My ingredients to happiness Dodgers. Politics. Reading. Nuff’ said. Oh and the occasional trip to the beach.

References


