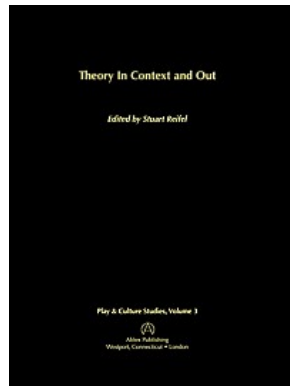


## Cover



Page i

**Play & Culture Studies**

**Volume 3**

***Theory In Context and Out***

Page ii

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Page iii

# Theory In Context and Out

*Edited by Stuart Reifel*

**Play & Culture Studies, Volume 3**



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## Contents

<i>Introduction by Stuart Reifel</i>	ix
<b>Part I: Foundations and Theory of Play</b>	
1. What Is Play For? Sexual Selection and the Evolution of Play <i>Garry Chick</i>	3
2. Reframing the Variability of Players and Play <i>Brian Sutton-Smith</i>	27
3. Play and Postmodernism <i>Thomas S. Henricks</i>	51
4. The Concept of Play in Hans-Georg Gadamer's Hermeneutics: An Educational Approach <i>Kjetil Steinsholt and Elin Traasdahl</i>	73
5. Symbolic Play and the Evolution of Culture: A Comparative Life History Perspective <i>Warren P. Roberts</i>	97
<b>Part II: Gender and Children's Play</b>	
6. Boys Who Play Hopscotch: The Historical Divide of a Gendered Space <i>Derek Van Rheenen</i>	111
7. The Interaction of Gender and Play Style in the Development of Gender Segregation <i>Julie Tietz and Stephanie Shine</i>	131
8. Boys and Girls at Play: Recess at a Southern Urban Elementary School <i>Olga S. Jarrett, Beth Farokhi, Catherine Young, and Gwen Davies</i>	147
<b>Part III: Theory of Mind</b>	
9. Explaining the Connection: Pretend Play and Theory of Mind <i>Angeline Lillard</i>	173

10. Imaginary Companions: Characteristics and Correlates <i>Marjorie Taylor, Stephanie M. Carlson, and Lynn Gerow</i>	179
11. A Study of Pretend Play and False Belief in Preschool Children: Is All Pretense Metarepresentational? <i>Mark Nielsen and Cheryl Dissanayake</i>	199
12. A Developmental Link Between the Production of Gestural Representation and Understanding of Mental Representation <i>Thomas Suddendorf</i>	217
13. Pretending, Understanding Pretense, and Understanding Minds <i>Angeline Lillard</i>	233
14. Understanding the Pretense–Theory of Mind Relationship <i>Robert D. Kavanaugh</i>	255
<b>Part IV: Adult–Child Play</b>	
15. Maternal Scaffolding of Taiwanese Play: Qualitative Patterns <i>Jui-Chih Chin and Stuart Reifel</i>	263
16. Parental Notions about Their Children’s Playfulness and Children’s Notions of Play in the United States and Hong Kong <i>Robyn M. Holmes</i>	291
17. Validity of Three Tests of Playfulness with African American Children and Their Parents and Relationships among Parental Beliefs and Values and Children’s Observed Playfulness <i>Carolyn Porter and Anita C. Bundy</i>	315
18. Attitudes of Parents and Teachers about Play Aggression in Young Children <i>James E. Johnson, Susan J. Welteroth, and Susan M. Corl</i>	335
<b>Part V: Classroom Play</b>	
19. Play as a Learning Medium—Revisited <i>James F. Christie</i>	357
20. The Effects of Situational Context on Playful Behaviors of Young Preschool Children <i>Arleen T. Dodd, Cosby S. Rogers, and Jeanne T. Wilson</i>	367

21. Bilingual Children's Language Usage During Dramatic Play <i>My-ae Han, Alfredo Benavides, and James F. Christie</i>	391
22. Factors in Three- to Five-Year-Old Children's Play <i>Olivia N. Saracho</i>	401
<i>Author Index</i>	417
<i>Subject Index</i>	427
<i>About the Contributors</i>	433



Page viii

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## Introduction

Volume 3 of *Play & Culture Studies* builds on the foundations established in the first two volumes of this series (Duncan, Chick, & Aycock, 1998; Reifel, 1999). Our purpose is to further discourse and understanding about the complex phenomenon we know as play. Play, as a human and animal activity, can be understood in terms of cultural, social, evolutionary, psychological, and philosophical perspectives. This effort necessarily includes inquiry from a range of disciplines, including history, sociology, psychology, education, biology, anthropology, and leisure studies. Work from a number of those disciplines is represented in this book.

As has been the practice in previous volumes, we draw heavily on papers and participants who comprise the The Association for the Study of Play (TASP). A number of the chapters in Volume 3 began as presentations at the 1998 meeting of TASP in St. Petersburg, Florida. Other chapters were prepared independently of that meeting. Chapters were subjected to blind review to maintain quality. I am grateful to contributors for their conscientious and timely participation in this process.

The topics addressed in this book in some ways reflect themes long established in the field. One major difference with Volume 3 is that a much higher proportion of studies included deal with children's play; this year, three-quarters of the chapters address aspects of children's play. Of course, children's play has been a common, continuing theme in play inquiry for decades, but in past years there had been a much more extensive representation of scholarship from diverse disciplines. We can only hope that this state of affairs reflects a vital period in childhood play studies, and not a waning of interest in the topic by those in other fields.

I have organized the following chapters into five parts. Part I on "Foundations and Theory of Play" includes a number of conceptual analyses of play. Chapter 1 is Garry Chick's TASP Presidential Address on "What Is Play For? Sexual Selection and the Evolution of Play," reflecting a novel anthropological reconceptualization of the function of play. Other social and evolutionary critiques of play appear in Brian Sutton-Smith's "Reframing the Variability of Players and Play" (Chapter 2), Thomas Henricks's "Play and Postmodernism" (Chapter 3), Kjetil Steinsholt and Eli Traasdahl's "The Concept of Play in Hans-Georg Gadamer's Hermeneutics: An Educational Approach" (Chapter 4), and Warren P. Roberts's "Symbolic Play and the Evolution of Culture: A Comparative Life History Perspec-

tive” (Chapter 5). Some of these contributors provide perspective on themes that recur in the chapters on children’s play that follow.

The chapters on children’s play are arranged into four parts. Part II deals with “Gender and Children’s Play.” Using different methodologies and addressing gender from different perspectives, these studies look at the history of a gender-linked game (Chapter 6, “Boys Who Play Hopscotch: The Historical Divide of a Gendered Space” by Derek Van Rhee), observations of playmate selection (Chapter 7, “The Interaction of Gender and Play Style in the Development of Gender Segregation” by Julie Tietz and Stephanie Shine), and analysis of observed gender differences in outdoor play (Chapter 8, “Boys and Girls at Play: Recess at a Southern Urban Elementary School” by Olga S. Jarrett, Beth Farokhi, Catherine Young, and Gwen Davies).

Part III is a collection of papers and commentary on “Theory of Mind.” These chapters began as a panel at the 1998 TASP meeting, organized by Angeline Lillard, who introduces this part of the book with Chapter 9, “Explaining the Connection: Pretend Play and Theory of Mind.” Each chapter addresses how play may be linked with some aspect of children’s growing awareness of their own thought processes, whether through imaginary playmates (Chapter 10, “Imaginary Companions: Characteristics and Correlates” by Marjorie Taylor, Stephanie M. Carlson, and Lynn Gerow), false beliefs (Chapter 11, “A Study of Pretend Play and False Belief in Preschool Children: Is All Pretense Metarepresentational?” by Mark Nielsen and Cheryl Dissanayake), play gesture (Chapter 12, “A Developmental Link Between the Production of Gestural Representation and Understanding of Mental Representation” by Thomas Suddendorf), or pretense (Chapter 13, “Pretending, Understanding Pretense, and Understanding Minds” by Angeline Lillard). Theory of mind is proving to be a fertile area for the psychological study of play, and Robert Kavanaugh provides perspective on these studies in Chapter 14, “Understanding the Pretense-Theory of Mind Relationship.” I am grateful to Angel Lillard for her contributions to the TASP panel and this part of the book.

In Part IV, “Adult–Child Play,” we broaden the contexts of child play to include the parents and teachers who participate in play, as well as a number of different cultural settings. Chapter 15 (“Maternal Scaffolding of Taiwanese Play: Qualitative Patterns” by Jui-Chih Chin and Stuart Reifel) describes developmental and cultural influences on pretend, while Chapter 16 (“Parental Notions About Their Children’s Playfulness and Children’s Notions of Play in the United States and Hong Kong” by Robyn M. Holmes) explores parental thinking about play crossculturally. The topic of parental thinking is continued in Chapter 17 (“Validity of Three Tests of Playfulness with African American Children and Their Parents and Relationships Among Parental Beliefs and Values and Children’s Observed Playfulness” by Carolyn Porter and Anita Bundy) and is expanded to in-

clude teachers in Chapter 18 by James E. Johnson, Susan J. Welteroth, and Susan M. Corl, “Attitudes of Parents and Teachers About Play Aggression in Young Children.”

Part V revisits children’s play activities in “Classroom Play.” James F. Christie looks at “Play as a Learning Medium—Revisited” in Chapter 19. Other chapters analyze children’s play at school in terms of context (Chapter 20, “The Effects of Situational Context on Playful Behaviors of Young Preschool Children” by Arleen T. Dodd, Cosby S. Rogers, and Jeanne T. Wilson), speech (Chapter 21, “Bilingual Children’s Language Usage During Dramatic Play” by My-ae Han, Alfredo Benavides, and James Christie), and other developmental issues (Chapter 22, “Factors in Three- to Five-Year-Old Children’s Play” by Olivia N. Saracho).

This is my final effort as series editor of Play & Culture Studies. Beginning with Volume 4, the series will be overseen by Jaipaul Roopnarine. I wish to express my thanks to colleagues at TASP, contributors to the series, and production staff at Ablex Publishing who have supported the inauguration of this series. I also wish to acknowledge the assistance of Connie Ybarra and Laura Harlick, who handled any number of organizational and technical matters during preproduction of this book. And a volume like this is dependent on reviewers who provide invaluable scholarly perspective on contributions; for Volume 3 those reviewers were Teresa Acosta, Alan Aycock, Margaret Carlisle Duncan, Theresa Escobedo, Greta Fein, Joe Frost, Lisa Goldstein, Linda Hughes, Faye McMahon, Alice Meckley, Mary Rivkin, Cosby Steele Rogers, Stephanie Shine, Dorothy Sluss, John Sutterby, Brian Sutton-Smith, Derek Van Rheen, Jacqueline Woolley, and June Yeatman.

*Stuart Reifel, Series Editor*

*University of Texas at Austin*

## REFERENCES

- Duncan, M. C., Chick, G., & Aycock, A. (Eds.). (1998). *Play & culture studies: Volume 1. Diversions and divergencies in fields of play*. Greenwich, CT: Ablex.
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Page xii

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## **Part I Foundations and Theory of Play**

Page 2

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## **Chapter 1 What Is Play For? Sexual Selection and the Evolution of Play Garry Chick**

Play primarily affords juveniles practice toward the exercise of later skills.

Peter K. Smith (1982)

The only thing that play prepares you for is more play.

Brian Sutton-Smith (often)

Peter K. Smith and Brian Sutton-Smith are two of the premier play theorists of our time. How is it, then, that their opinions about the purpose of play seem to differ so dramatically, at least as based on the two statements quoted above? Indeed, what is the purpose of play? Why does it exist? These are all difficult questions, but the latter two seem to be especially intransigent. The purpose of this chapter is to examine the first question—how can Smith<sup>1</sup> and Sutton-Smith hold such apparently contradictory opinions—in the hope of shedding some new light on the second and third questions.

Eminent biologist and coarchitect of the synthetic theory of evolution, Ernst Mayr, has noted that every question that one can ask has two very distinct kinds of answers (Goldsmith, 1991; Mayr, 1997). Why do birds sing? Why do people look for food if they have not eaten for a time? Both of these reactions can be explained as more or less predictable responses to the effects of certain environmental conditions on the nervous systems of birds and of people (Goldsmith, 1991). This is an explanation of proximate cause, but it says nothing about how these responses developed in evolutionary time. If we claim that birds sing in

Keynote address presented at the annual meeting of The Association for the Study of Play, St. Petersburg, Florida, February 1998.



order to attract mates or to establish territories wherein they can successfully support their offspring, and that people eat because self-correcting homeostatic mechanisms that we, along with all other living things, have evolved kick into action when energy reserves run low, then we have evoked an explanation of ultimate causation. In cultural terms, proximate explanations may enlighten us regarding the outbreak of World War I but if we ask why war exists at all, we must look for ultimate, hence evolutionary, explanations. Explanations of proximate and ultimate cause do not compete, but are complementary in both the biological and cultural realms, and the preference to seek one, rather than the other, is based on personal interest, not on any notion that either sort of explanation is somehow more correct than the other. Indeed, each should inform the other.

Explanations of play that involve either proximate or ultimate cause, or both, are common in the literature. However, though evolutionary explanations—and hence ultimate explanations—of play pepper the literature, their success in answering the question, “What is play for?” has been limited. Explanations of the ultimate causation of play (e.g., Lewis, 1982; Poirier, 1982; and Smith, 1982) represent the perspective that play developed through natural selection, because it is somehow beneficial to the species. That is, it aids somehow in survival and reproductive success. Sutton-Smith asserts that such explanations are poppycock, though he does not hint at why play should be so ubiquitous among mammals. Why should being prepared for more play be of any evolutionary significance?

The major studies of the evolutionary significance of play—and there are many of them—almost always begin with natural selection, Darwin’s great insight into the engine of biological evolution. Darwin (1859) expressed it as follows:

As many more individuals of each species are born than can possibly survive; and as, consequently, there is a frequently recurrent struggle for existence, it follows that any being, if it vary however slightly in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be *naturally selected*. From the strong principle of inheritance, any selected variety will tend to propagate its new and modified form. (p. 3)

Thus, living things express four features:

1. Many more offspring are born than can possibly survive.
2. Though offspring typically resemble their parents, they always exhibit some measure of variation from their parents and among themselves.
3. Some variation in traits can be inherited.

4. Inheritable traits that afford some individuals greater opportunity to survive and reproduce will increase in the population.

Hence, the fit of organisms to their environments is improved through natural selection. But, natural selection does not “improve” organisms in any moral sense, nor is it goal directed. Human beings were not an inevitable result of the evolutionary process on Earth and would likely not result again should the process somehow be restarted (e.g., Gould, 1989, 1996). The fit of organisms to their environment is based on their phenotype, the expression of their genotype, and phenotypes involve both the physical character of organisms and their behavior. Play, as such, is a characteristic of most, if not all, mammalian phenotypes.

Though the evolution of play is virtually always considered as the result of natural selection (see, for example, Bekoff & Byers 1998; Fagen, 1981; Smith, 1982), Darwin’s two related engines of evolution, artificial and sexual selection, are rarely mentioned. However, given that play has been slow to yield its nature to studies of ultimate causation based solely on natural selection, the purpose of this paper is to suggest that play be considered in light of artificial selection and, especially, sexual selection. First, however, it seems prudent to review some of the things that we think we know about play at the most general level.

## **WHAT DO WE THINK THAT WE KNOW ABOUT PLAY?**

We think that we know some things about play and it is probable that some of the things that we know are actually true. Several of these are listed below. However, what we think we know about play depends to a significant degree on how play is defined. There are numerous definitions of play in the literature and I do not wish to select one of them or conjure up others here. It is sufficient to say at this point that there is relatively high interobserver consensus in describing behavior labeled as play, at least as it occurs among most species (Bernstein, 1982). Burghardt (1998), for example, describes “phenomena, if seen in a mammal or bird, would be readily labeled playful by most observers” (p. 2) in turtles. Obviously, the further that other species are removed phylogenetically from our own, the less reliable such observations will be.

1. *Play is characteristic of vertebrates.* Though a contemporary of Darwin reported observing play among ants, there is currently only equivocal evidence to suggest that it occurs, at least extensively, among nonvertebrates. Among vertebrates, play is generally thought to be all but a universal among mammals. Though it occurs among many birds, it seems to be either rare or nonexistent among other vertebrates, including fish, amphibians,

and reptiles. There are, however, reports of possible play among crocodilians (Lazell & Spitzer, 1977), among juvenile African chameleons (Burghardt, 1982), and some turtles (Burghardt, 1998). Object play has even been reported recently in the octopus (Service, 1998) which, if correct, would be the first convincing evidence for play in an invertebrate species. A problem, of course, is that recognizing play among reptiles, other vertebrates, or invertebrates may be extremely difficult. While the play face, for example, is widespread among certain mammal groups (e.g., primates, canids), it is difficult to imagine what it might look like in the octopus. Finally, the fact that invertebrates greatly outnumber vertebrates among the animal species of the world means that play is a relatively rare phenomenon (Fagen, 1995).

*2. Play is characteristic of organisms with relatively long life spans.* It is often said that long-term benefits must outweigh immediate costs in order for play to be adaptive. If there is no long term, then the costs of play would be too high to bear. On the other hand, some very long-lived species apparently do not play. Some turtles, for example, as well as other reptiles, have very long life spans but lack play. The same is true of certain amphibians and even some insects (e.g., locusts). Non-sexually reproducing microorganisms (e.g., amoeba) have, in principle, infinite life spans, but do not play. So this particular truism about play may generally apply to mammals but not to animals in general.

*3. Play seems to be correlated with the relative size and complexity of the neocortex.* This point is, of course, related to the first. Mammals have larger and more complex brains than do birds, reptiles, and other vertebrates and invertebrates (though the octopus, an invertebrate, may outdo many vertebrates, including some mammals, in this respect). Brain size and complexity correlates with size of behavioral repertoire, particularly with the part of the behavioral repertoire that is learned. During their lifetimes, plants apparently never learn anything and the vast majority of animals learn very little. Big-brained mammals learn a lot and there are probably still a few social and behavioral scientists around who ascribe to the view that humans must learn everything that they end up knowing. Since it must be assumed that increased brain size and complexity came about for adaptive reasons during evolution, it should therefore be difficult to dismiss play from this process.<sup>2</sup>

*4. Play is most typical of young animals and peaks during periods of maximal cortical development.* Lawick-Goodall (1968) found that the frequency of play among wild chimpanzees changes dramatically across the life span. Among chimps between the ages of 0 and 2, she observed more than 60 play sessions per 100 observational periods. This figure rose to more than 200 for chimps between the ages of 2 and 9 years. After that period, the frequency of play dropped dramatically with adult males engaging in fewer than 10 play sessions per 100 observational periods and adult females fewer than 5. Adult females with offspring did play more, exhibiting approxi-

mately 25 play sessions per observational period. Similar observations have been made of other playful species. Bekoff and Byers (1981, p. 297) indicate that since “natural selection operates at all ages” it is likely that “differential early play experience most probably can affect subsequent individual development and reproductive fitness.”

5. *Play commonly involves behavior patterns adapted from their usual contexts.* The behaviors exhibited in animal play seem to be taken largely from the survival-related contexts affectionately known as the “four Fs”; that is, fighting, fleeing, feeding, and mating. These are all obviously important and, as the quote from Smith (1982) suggests, if learning that takes place in juvenile play affords greater success in any of all of these as an adult, then play should be worth the risks that it poses. And the risks are real. Play can result in injury, devolve into actual fighting, opens animals involved in play to predation, and is seemingly wasteful of both time and energy.

6. *Play disappears under stress.* If you happen to be a member of a prey species, and your response to the appearance of a predator is play, your genes have a diminished chance of being passed on to the next generation. Similarly, the frequency of play has been observed to diminish under conditions of deprivation, particularly of food (e.g., Baldwin & Baldwin 1976; Müller-Schwarze, Stagge, & Müller-Schwarze, 1982; Poirier, 1982).

7. *Play typically involves the communication, “This is play.”* Animals engaged in social play or who wish to play with others commonly communicate that through stylized gestures, postures, movements, or facial expressions (the “play face”) (Bekoff, 1974; Bekoff & Allen, 1998; Bekoff & Byers, 1981; Lawick-Goodall, 1968; Smith, 1982). This is functional, given that play behaviors are typically derived from important adult behavior contexts (the “four Fs”). Obviously, it is important that animals be able to differentiate between play fighting and real fighting (e.g., Aldis, 1975; Bekoff, 1975; Pellis & Pellis, 1996, 1998) since the latter can result in injury or even death.

8. *Species that maintain significant levels of playfulness into adulthood typically also retain other neonatal characteristics.* In 1926, Louis Bolk described a number of neonatal characteristics in humans (compared to apes), including a rounded, vaulted cranium, a juvenile face (flat, with small jaws and teeth, no brow ridges), forward positioning of the foramen magnum, delayed closure of the cranial sutures, an unrotated, unopposable big toe, and an extended period of playfulness. We have bred neonatal characteristics into domestic animals as well, especially in dogs, but also in animals such as pigs, cattle, and cats. Recent evidence indicates that all dogs are descended from wolves. However, adult wolves play only rarely while dogs remain playful throughout their lives. Many breeds retain various other neonatal characters, as well. The currently most popular breed in the United States, the Labrador retriever, is a good example. Like pups, the Lab retains floppy ears, a relatively short muzzle (by wolf standards), a

thick body, and relatively short legs. I have heard it said of Labs that they remain puppies for about 12 years and then they die.

9. *Play is fun*. Play has long resisted definition (see, for example, Burghardt, 1998; Fagen, 1981; Martin & Caro, 1985), but it seems to evoke high interobserver agreement when seen. We know it when we see it and one of the things that tells us that an activity is playful is that it looks like fun. Colts gamboling or dogs play-fighting seem to be having fun, though that certainly is an anthropomorphization. As with the other characteristics of play reviewed here, its property of fun becomes more difficult to recognize in animals that are more widely separated from us phylogenetically.

Other characteristics have been described for play, including that it has no clear immediate function, that it is energetically expensive, that it involves breakdown or reversal of typical role relationships, and that it involves awkward or exaggerated movements (see, for example, Burghardt, 1984). There may be more as well, but this list is sufficient for the purpose of this chapter. Given these characteristics, the next question to ask is whether or not, and if so, how, is play adaptive?

### **IS PLAY ADAPTIVE?**

The amount of controversy and discussion resulting from this question is probably second only to that produced by the many efforts to define play. Even the concept of adaptation itself is controversial. Several quotes frame the problem:

Play would not be so widespread among mammals were it not adaptive. (Poirier, 1982, p. 167)

To begin with, it seems reasonable to assume that play, like all other behavior (and structure), has evolved for some reason (often assumed to be an adaptive reason). (Lewis, 1982, p. 166)

If play were not functional, animals that played would be at a selective disadvantage compared to non-playing animals that husbanded their resources, used their time more profitably, and avoided the inevitable risks of injury and exposure to predators. (Symons, 1978, pp. 2–3)

Even were play a necessary condition for normal development, as may well be the case, it does not follow that animals play for that reason. (Ghiselin, 1974, p. 260)

The apparent lack of a single function or selectional basis for play should come as no big surprise, given the vastly different sets of selection pressures that have operated on the diverse species that display play. (Suomi, 1982, p. 169)

### What Is Adaptation?

Durham (1991) defined adaptation as “the appropriateness or ‘fit’ of an organism’s form and function to prevailing environmental conditions” (p. 14). However, simply functioning well in an environment is not enough. Barash (1979) pointed out that “the ultimate measure of such functioning is how successful an individual is in replicating itself while others are independently trying to do the same thing” (p. 20). So, for play to be adaptive, it would assist playful animals both to function well in their environments and to reproduce successfully. Since, by many definitions, play lacks immediate functions or benefits, it has typically been assumed that the benefits of play are delayed. So, while a behavior such as play that appears to have immediate costs (e.g., it’s dangerous and costly in time and energy), has longterm benefits that outweigh the immediate costs, the behavior can be adaptive. Play has been so described (Smith, 1982).

However, there is a longstanding argument about adaptation that is still being played out on the most public of arenas (for such a thing). In one corner, we have Richard Dawkins, British biologist, ultra-Darwinist, and adaptationist. In the other lurks Steven Jay Gould, American biologist, Darwinist of sorts, and anti-adaptationist. The fun part is that Dawkins and Gould are undoubtedly the world’s two most prominent popularizers of evolutionary thinking. Each has written several influential books on evolutionary theory that are intended for scientific and public consumption. While their argument is beyond the scope of this chapter, a couple of relevant points should be made. In the quotes above, Poirier, Lewis, and Symons indicate strongly that play *must* be adaptive or it would not exist. On the other hand, Gould and Lewontin (1979) use the apocryphal expression “adaptationist program” to characterize those who attempt to show the adaptedness of organisms and their characteristics. Lewontin (1979) presented the extreme version of this position as those who assume “without further proof that all aspects of the morphology, physiology, and behavior of organisms are adaptive optimal solutions to problems” (p. 6). Parts of our physiology, such as wisdom teeth and the appendix, clearly are not adaptive and some are nice, but obviously did not evolve for certain present functions. Five digits on each hand are good for touch typing and piano playing but certainly did not evolve for those activities. So, trying to explain how *all* phenotypical characters, both morphological and behavioral, are adaptive is doomed to failure. Later, Gould and Vrba (1982) suggested that the term “adaptation” only be used when a trait possessed by an organism both promotes the fitness of the organism and currently performs the function for which it was selected. For other structures that are useful for their present role, but were not designed for it, they proposed the term “exaptation.”

Burghardt (1998) indicates that there are “two perennial views of why play exists” (p. 5). These are, first, that play somehow prepares the player

for the future, or, second, that “play is a legacy from the past” (p. 6). The quotes from Smith and Sutton-Smith at the beginning of this paper are examples of the former, though they differ in terms of what the player is being prepared for. If the former interpretation is correct, then play seemingly is an adaptation, as any preparation that would permit an organism to succeed as an adult would be valuable. On the other hand, if play is a leftover (either as a form of recapitulation or as the expenditure of surplus energy on activities already well fixed in instincts), play would, at best, be an exaptation. The possibility that play is an exaptation has been discussed by Burghardt (1998) but the great majority of ultimate causal explanations for play are of the preparation theory sort (Burghardt, 1998).

### **Hypothesized Functions of Play**

A relatively small number of preparation for the future benefits of play have been proposed. Numerous functions have been attributed to play but nearly all fall into three general categories: play as physical training, play as social training, and play as cognitive training (Bekoff & Byers, 1981). More specific effects of play include skill development (in terms of predation, fleeing, and sexual behavior), social bonding, learning, cognitive development, development of behavioral plasticity, and problem solving. Play could have been selected for each or all of these, though in different proportions for different species. For extensive reviews of these hypothesized functions of play, see, for example, Bekoff and Byers (1981), Fagen (1981), and Smith (1982, 1995).

The problem is that there seems to be little solid evidence for any of the hypothesized functions of play (Bekoff & Byers, 1981; Smith, 1995). Fagen (1981) reviews substantial evidence that indicates that, instead of preceding the mastery of many skills, play follows it in many cases. Moreover, the fact that play occurs among adults in many species, though it may not occupy nearly so large a percentage of time as among juveniles, renders practice-for-the-future hypotheses suspect (Bekoff & Byers, 1981; Fagen, 1982; Hall, 1998). Further, it is important to remember that (1) the present functions of play may not be the same as past functions (Bernstein, 1982), (2) what appear to be present functions of play may not be the reasons for which play evolved (Burghardt, 1998), and (3) play may have evolved independently in different species (i.e., convergent evolution), possibly for the same reasons or for different reasons (Burghardt, 1998).

The hypothesized functions of play noted above all presumably came about through natural selection as they are purportedly adaptive in some fashion or another. There are, however, alternate ways of looking at the functionality of play that do not involve the notion of adaptation as it relates to natural selection. In a section of his 1974 book, *The Economy of Nature and the Evolution of Sex*, titled “An Exemplary Puzzle in Evolution-

ary Psychology,” Michael T. Ghiselin indicated that “We can sum up the literature in a few words: those who think that they know what play is ‘for’ have reasoned from false premises” (p. 259). He immediately rejected surplus energy, practice, and development theories for play. Instead, he hypothesized that the protection of members of social groups from competitive interactions may be the primary function of play. Ghiselin suggested that “Little boys playing soldier are not practicing to slaughter their fellow men, but furthering peaceful life within their own society. The way to make a killer out of a child is to put him into a genuinely competitive situation—such as Little League Baseball” (p. 261). Finally, he proposed the idea that human moral traits may not be due to natural selection at all but instead to the result of artificial selection. Though morals and play are not the same thing, the important point is that mechanisms other than natural selection might be involved in the ontogeny of both. Before exploring this possibility further, it is prudent to review Darwin’s (1859, 1871) explication of the forces of evolution.

## THE ENGINES OF EVOLUTION

Charles Darwin (1859) proposed that the prime mover in biological evolution is what he termed *natural selection*. Darwin based his theory of evolution by natural selection on two simple facts. First, individuals increase in number faster than do resources available to them. This he took from the work of Malthus (1798/1803). Second, members of any species vary among themselves. Darwin reasoned that since some offspring die while others survive, and individual members of species vary, those individuals who are best served by their inherited characters in local conditions will leave more offspring. And these offspring tend to resemble their successful parents. This leads to the accumulation of valuable variations and, hence, to evolutionary change. Darwin put it as follows:

As many more individuals of each species are born than can possibly survive: and as, consequently, there is a frequently recurrent struggle for existence, it follows that any being, if it vary however slightly in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be *naturally selected*. (1859, p. 3)

But Darwin (1859) also recognized the importance of two other mechanisms for evolutionary change. The first, with which he became familiar from animal breeders, he termed *artificial selection*. He noted that “One of the most remarkable features in our domesticated races is that we see in them adaptation, not indeed to the animal’s or plant’s own good, but to man’s use or fancy” (p. 21). Further, Darwin suggested that artificial selec-



tion may be of two types. First, it may be “methodical” in that it is deliberate, as where bigger ears of corn with better tasting grain is kept for seed so that future generations of corn plants retain those characteristics. Artificial selection might also be unconscious, as where individual members of a species are bred preferentially but with no specific phenotypical goal in mind or where breeders are literally unaware that they are breeding animals or plants with some characteristics in preference to others.

Darwin (1859) proposed *sexual selection* in *The Origin of Species* but treated it at much greater length in *The Descent of Man and Selection in Relation to Sex* (1871). Like artificial selection, sexual selection comes in two varieties. The first, competition, is intrasexual and occurs mostly among males. One type of competition is when males fight for access to females, typically in species in which dominant males gather harems of females. For their prowess, the victorious males enjoy nearly or totally exclusive sexual access to the females. Presumably, the traits that made them dominant are passed on to offspring. Male–male competition can range from deadly combat to displays and bluffs. The other type of competition involves a struggle for possession of a critical resource, typically either food or breeding locations, that females require. Darwin described competition as follows:

This form of selection depends, not on a struggle for existence in relation to other organic beings or to external conditions, but on a struggle between the individuals of one sex, generally the males, for the possession of the other sex. (1859, p. 65)

Choice, the second variety of sexual selection, is intersexual and most often the province of females. Female choice permitted Darwin to explain the often gaudy—and seemingly maladaptive—adornments often carried by males of many species, especially among birds. The showy feathers (not really tail feathers but feathers of the lower back) of the peacock is the canonical example. Darwin commented on choice in the following manner:

I can see no good reason to doubt that female birds, by selecting during thousands of generations, the most melodious or beautiful males, according to their standard of beauty, might produce a marked effect. (1859, p. 66)

Elegant research shows that females of various species do, in fact, mate preferentially with the most highly adorned males. Female choice was confirmed in classic experiments conducted in the 1980s. The African widowbird, a polygynous bird that nests in open grasslands in Kenya, was the subject of one such experiment (Andersson, 1982). Widowbird males, with bodies about the size of the North American cardinal, have extremely long tail feathers, some 19 1/2 inches. Females, on the other hand, have 2 3/4 inch tails. Males attract females by flying low, slow maneuvers over their territories with tail

feathers fanned. After mating, females nest in tall grass and the males take no part in rearing the young. Andersson (1982) hypothesized that the elongated tail plays a role in mate attraction. Hence, all of the males in an area were captured and treated in one of four ways. First, some were simply released as a control group to show that capture did not influence mating success. The second control group had their tails cut but then replaced (glued). The third, the experimental group, had their tails shortened to about 6 inches. Their feathers were then used to extend the tails of the fourth group to about 29 1/2 inches. Andersson (1982) found that females preferred the newly longer-tailed males by a ratio of 4 to 1 over their shorter-tailed colleagues and about 3 to 1 over the control birds. It should be pointed out that the longer tail feathers inhibited the flight of the experimental group which would have likely put them at greater risk of predation. So there are some natural controls on the lengths (literally) to which males will go to attract females.

Haines and Gould (1994) conducted a second confirming experiment with guppies. In this case, female guppies preferred males with the largest tails (with an average tail area of 34 sq. inches) by a ratio of 4 to 1 over those with the smallest tails (average tail area of 2 1/2 sq. inches) and 3 to 1 over individuals with medium-sized tails (averaging 7 sq. inches). Those with average tails were preferred by a factor of 3 over those with the smallest tails. In this experiment, actual mating results were counted and, of the females that became pregnant, 80 percent gave birth to large-tailed fry (Haines & Gould, 1994). Finally, since the large-tailed guppies also displayed more frequently, Haines and Gould heated the tanks of the smaller tailed fish, thereby increasing their display rates. Under this condition, the advantage of the large-tailed males dropped to 3 to 2 over those with smaller tails, meaning that about 2/3 of the variation in female choice was due to display frequency but 1/3 was still due to tail size.

Unlike natural selection, sexual selection is competition solely in the arena of reproduction. Hence, animals may develop characteristics under the influence of sexual selection that are otherwise adaptively neutral or even negative (Ghiselin, 1989). The peacock's feathers are an example. Darwin, in *The Descent of Man and Selection in Relation to Sex* (1871), discussed many such features in terms of what he called primary and secondary sexual characteristics. For the most part, Darwin meant the sexual organs themselves when referring to primary sexual characteristics. Among secondary sexual characteristics, he included attributes that were of no value other than to confer a reproductive advantage for one individual over another of the same sex. These could be physical, such as antlers on male deer or scent glands that occur in various species, or behavioral, such as bird songs or courage and aggressiveness. He claimed that:

Thus it is, as I believe, that when the males and females of any animal have the same general habits of life, but differ in structure, colour, or ornament,

such differences have been mainly caused by sexual selection. (Darwin, 1859, p. 66)

It is important to note that Darwin recognized that sexual selection could lead to change in both physical and behavioral characters in the competition for reproductive success. This is perhaps best displayed in the bowerbird. Males of the 18 species of bowerbird build and decorate edifices that are part of the displays used to attract females. There is a strong inverse correlation between the degree of male coloration (physical) and the elaborateness of the constructions (behavioral) for each of the species. Males of relatively unornamented species build the most elaborate and highly decorated bowers, while brightly colored species construct simpler and less decorated bowers (Gould & Gould, 1997). The most dominant males of each species are those with the best-built, least-damaged (males raid each other's bowers both to damage them and to steal decorations), and most elaborately decorated bowers.

#### **Artificial and Sexual Selection in Humans**

Only momentary reflection is required to make it clear that humans engage in both intrasex competition and intersex displays to attract mates. Both men and women resort to everything from gossip and hostile stares to murder in the competition for potential mates. Your own experiences in high school should confirm this (excepting the murder part, we hope). Similarly, both males and females engage in elaborate displays that include both behavioral and material components, sometimes using the latter to compensate for presumed physical shortcomings. Displays of wealth and status (e.g., elegant clothes, homes, cars, gifts, and so on) are used both in intrasexual competition and to influence intersexual choice.

David Buss is among the foremost mate-choice researchers. He has found, in particular, that men and women differ in terms of what they look for in a potential mate. Male and female preferences are shown in Table 1.1.

Although the rank ordering for males and females are largely concordant, I have emphasized the differences (physical attractiveness, good earning capacity) that have attracted the most interest from researchers. Men seem to be much more interested in the physical attractiveness of their mates than in their earning capacity, and more interested in physical attractiveness, in general, than are females. Females, on the other hand, indicate that they are also more interested in physical attractiveness than earning capacity but not by the margin shown by males. Cross-cultural research by Buss (1989) showed that, in 36 of 37 cultural samples, females placed higher value on the prospective earning capacity of mates than do males. Males in each of the 37 samples preferred younger mates while females prefer older males. In fact, females appeared to prefer a larger age difference between

**TABLE 1.1****Ranking of Characteristics Sought in Mates by Men and Women (from Buss [1989])**

Rank	Male Preferences	Female Preferences
1.	Kindness & Understanding	Kindness & Understanding
2.	Intelligence	Intelligence
3.	<i>Physical Attractiveness</i>	Exciting Personality
4.	Exciting Personality	Good Health
5.	Good Health	Adaptability
6.	Adaptability	<i>Physical Attractiveness</i>
7.	Creativity	Creativity
8.	Desire for Children	<i>Good Earning Capacity</i>
9.	College Graduate	College Graduate
10.	Good Heredity	Desire for Children
11.	<i>Good Earning Capacity</i>	Good Heredity
12.	Good Housekeeper	Good Housekeeper

themselves and their mates (3.42 years) than was true for males (2.66 years) (Buss, 1989). Males rated physical attractiveness higher than did females in each of the 37 samples, though three of the observed differences were not statistically significant.

These results accord with predictions made by Buss (1989) on the basis of evolutionary theory, specifically parental investment and sexual selection theory. Trivers (1972) hypothesized that sexual selection is partly driven by the different levels of investment that males and females contribute to their offspring. Among mammals, including humans, females tend to have significantly more parental investment in offspring than do males, though males may invest in their progeny in ways other than direct care. They may provide mates with food, defend territories, or defend both the female and the young against aggressors (Trivers, 1972). Trivers hypothesized that the sex that has the greater parental investment is also the one that is the choosier in terms of mate selection. Again, this would be most characteristic of females because greater reproductive costs accrue to the sex with the heavier investment and choice leads to better benefits.

Why do females typically invest more in offspring? The answer is clear from reproductive physiology. Sperm is cheap and plentiful while eggs are costly and rare by comparison. While most females in mammalian species manage to reproduce, their total reproductive capacity is sharply limited. Males lack similar physical limitations, though among social species in which dominant males collect harems of females, many males may never reproduce at all. It is in the best interest of females to mate with the highest quality males (genetically speaking) and then to invest heavily in their offspring. The same is not necessarily true for males, though cultural rules about monogamy, premarital chastity, and so on, place restrictions on the

procreative capacities of human males that bring them more in line with human female capacities, though recent public evidence suggests that high-ranking males may break these cultural rules with substantial frequency and relative impunity.

What sort of mate characteristics should human females and males prefer based on the above considerations? Females should choose mates who afford the best opportunity for survival for the relatively limited number of offspring that they can produce. So these characteristics would include good health and the other personal characteristics shown in Table 1.1 but, since human males do typically contribute to the welfare of their offspring, females should seek mates who would also provide resources, such as nourishment, shelter, and protection (Buss, 1989). In the modern world, such resources translate into earning capacity. Not surprisingly, earning capacity is a trait that is more highly valued in males by females than in females by males. Reproduction by males, however, is not particularly limited by the resources controlled by females. Moreover, since their reproductive capacity is far higher than that of females, males can afford to invest less in offspring. Hence, male reproduction is limited only by access to fertile females.<sup>3</sup> Therefore, males should preferentially seek fertile females and fertility in females is powerfully connoted by age (Buss, 1989). According to Buss:

Features of physical appearance associate with youth—such as smooth skin, good muscle tone, lustrous hair, and full lips—and behavioral indicators of youth—such as high energy and a sprightly gait—have been hypothesized to provide the strongest cues to female reproductive capacity (Symons, 1979). Sexual attraction and standard of beauty are hypothesized to have evolved to correspond to these features. On this account males *failing* to prefer females possessing attributes that signal high reproductive capacity would, on average, leave fewer offspring than would males who do prefer to mate with females displaying these attributes. (p. 2)

Male fertility, on the other hand, is less sharply age-graded and, hence, more difficult to assess on the basis of physical appearance (Buss, 1989). For females, therefore, the physical appearance of their mates should be less important than it is for males. As Buss notes, however, standards for beauty (e.g., slim versus plump, light skin versus dark skin, etc.) are heavily influenced by culture. Nevertheless, lack of symmetry in features or features that may suggest either advanced age or disease are rarely, if ever, regarded as signs of beauty. Buss felt that the sex differences in mate preference that he predicted would transcend cultural differences. As indicated in Table 1.1 and in the results that he reported from his crosscultural study (Buss, 1989), his predictions received substantial support.

But how is any of this relevant to play? First, playfulness is conspicuous by its absence in the research cited earlier (see also, for example, Ellis,

1992). Yet, play is overwhelmingly reported as a behavioral characteristic of young animals and surely signals youthfulness.<sup>4</sup> Second, play may be part of what respondents meant when they indicated preferences for several of the characteristics indicated in Table 1.1. For example, playfulness is more characteristic of healthy than sick animals. It could also be part of an “exciting personality,” or even “intelligence” and “creativity.” Who knows where “playfulness” would have been ranked had Buss (1989) chosen to include it as a potentially desirable characteristic in mates? My guess is that it would have ranked relatively high.

There may also be a darker side to all of this, however. Infanticide by males is common in many mammalian species.<sup>5</sup> Male lions, for example, may kill the suckling cubs in a pride when they depose the previously dominant male. Their purpose is to ensure that the females come into estrus as quickly as possible so that they can then sire offspring. Since males can rarely hold on to their dominant position for long, they must reproduce as quickly as possible in order to ensure that their genes are passed to the next generation. Female lions may try to hide their cubs but typically do not attempt to defend them otherwise. To do so would not be to their advantage in the face of a larger, more powerful, and determined male (Wrangham & Peterson, 1996). Among lion prides in the Serengeti, approximately one-fourth of all infants are lost to infanticide (Packer & Pusey, 1983, 1984).<sup>6</sup> Similarly, infanticide has been observed among various monkey species and, among apes, various combinations of infanticide and rape and/or battering of females has been observed. There is no evidence of infanticide among orangutans, generally thought to be the great ape most distantly related to humans, probably because these animals are solitary and only assemble to mate. On the other hand, Wrangham and Peterson indicate that “Most female orangutans are raped regularly” (p. 151). Moreover, “Every female chimpanzee gets battered, some are raped, and a few have their infants killed. Many or even most gorilla mothers experience infanticide—but they aren’t battered” (Wrangham & Peterson, 1996, p. 151). In humans, biological fathers abuse, neglect, and/or kill their children much less often than is the case for stepfathers (Buss, 1989; Daly & Wilson, 1980, 1984, 1985, 1987). But what does *this* have to do with play?

### **Play as a Signal**

Playfulness, as suggested above, may be a clear cue to youthfulness and health, both of which indicate reproductive value, especially in females. But playfulness may signal other things, as well. As noted by Ghiselin (1974), “A possible function for play is therefore clear: it protects the members of the society by preventing competitive interactions” (p. 261). To reinforce the point, Ghiselin claimed that “So long as everyone continues playing, nobody gets hurt” (p. 261) and “we seek out the company of persons with a

good sense of humor, not just because they are amusing, but because they are innocuous. Those who are always serious pose a threat” (p. 262). Ghiselin (1982) later argued that “People do less harm to one another when they are telling jokes or playing games than when they are fighting. People who play are not much of a threat to us, and we seek their company and cherish them, and this may be reasonably be expected to increase their Darwinian fitness” (p. 165).

We know, of course, that there are signals for play. But can play itself be a signal? Fagen (1992) has claimed that play and playfulness is a signal of “All’s well.” That is, it is important for animals to be able to communicate and to assess the well-being of others. Parents must assess the well-being of their offspring and potential mates “need to know about each other’s current physical and psychological well-being and need to be able to assess the other’s future health prospects” (Fagen, 1992, p. 48). But this form of play-as-signal is basically symmetrical: it communicates the same thing—state of well-being—between players. This may very well be important but signalling can also be asymmetrical: two (or more) animals engaged in play may be signalling different things to each other. Adult male lions occasionally play with cubs, for example. Among other playful species, including chimpanzees, gorillas, and humans, adult males sometimes play with infants and juveniles, as well. Such episodes involve standard play signals, such as the play bow and the play face, and, as Ghiselin has suggested, harm and threats of harm are minimized by the play context. Is it not therefore possible that females are more likely to select playful males (among species where intrasexual choice occurs) inasmuch as such males may be less likely to harm either the females or their offspring? Playfulness may well be a communication of the intent to do no harm when expressed by the more powerful (often, but not always, a male) of a pair (or group) of players. When expressed by a less powerful playmate (often, but again not always, a female), playfulness may signal well-being, itself a signal of reproductive value (Fagen, 1992).

We have clearly bred extended periods of playfulness into certain domestic animals, especially dogs and cats. As suggested by Sigmund (1993):

Did we possibly breed ourselves into playmates? ... If peacock females can breed for the long tails of peacock males, why should humans not breed for a strong play-urge in their children, by caring more for those who are fun to play with? (p. 207)

While differential care for children based on their playfulness is possible, I doubt that it is where selection for play takes place. I think that it is much more likely that both females and males choose playfulness in potential mates because it is a relatively unambiguous signal of reproductively important information. For females, I hypothesize that playfulness (in males)

signals a lower likelihood of doing harm. It is simply that playful males are less dangerous than serious males. For males, female playfulness signals something entirely different. It indicates youth and health, both of which are important for reproductive success.

## **SUMMARY: SO WHAT IS PLAY FOR?**

It is difficult to believe that play is not good for *something*, that it did not evolve for *some* good reason. Yet, Ghiselin (1974) was able to assert that “The literature on play, whatever its position on evolution, abounds in unfounded hypotheses and teleological posits” (p. 258). Moreover, the numerous hypotheses regarding the functional consequences of play have only limited support in animals (Martin & Caro, 1985) and possibly even less in humans (Smith, 1995). As Burghardt (1998) noted, “In most areas of behavior, the functional approach has yielded great rewards rather quickly once adaptive explanations have been carefully stated and explored. Unfortunately this has not been the case with play” (p. 3). So, was Smith (1982) right? Does play provide practice for future skills? Or, is Sutton-Smith correct? Does play merely prepare humans and other animals for more play? Or, is it somehow possible for both of them to be correct?<sup>7</sup>

I believe that adaptive, evolutionary, or functional explanations for the ultimate causes of play in animals and humans have not been as successful as expected because we have failed to consider seriously artificial and, especially, sexual selection as either complements or alternatives to natural selection. Explanations based on natural selection essentially revolve around the argument that play has long-term consequences, such as skill practice or physical and cognitive development, that outweigh immediate costs. Sutton-Smith’s assertion makes little sense if natural selection is the engine behind the evolution of play. On the other hand, it makes a great deal of sense if either or both artificial and sexual selection are considered with respect to play.

Sexual selection theory has only recently begun to receive the attention that it deserves. Darwin himself did not regard sexual selection to be as efficacious as natural selection because he felt that it involved only the number of offspring produced, rather than survival itself. But this means that Darwin ignored the fact that a long life span is irrelevant unless it leads to a high quantity of high quality offspring (Gould & Gould, 1997). In addition, sexual selection was ignored—or efforts were made to discredit it—because the very thought that choice exerted by females could have any effect on evolution simply did not sit well with a sexist scientific community. Sexual selection is rarely mentioned in research and theorizing on the evolution of play (e.g., Burghardt, 1998; Caro, 1988; Fagen, 1981, 1995) and, in turn, play is rarely mentioned in research and theorizing on sexual selection.



(e.g., Buss, 1989, 1994; Low, 1979; Ridley, 1993). But only a glance at the peacock is enough to appreciate the potency of sexual selection as an evolutionary force.

My purpose here is not to attempt to replace the consideration of play in terms of natural selection with artificial and/or sexual selection<sup>7</sup> but to suggest that the latter may further our understanding. Play *may* afford humans and other animals practice for future skills. But the principle skill to be practiced may be play itself. Play may prepare us for future play because playfulness is a signal worth retaining, though it may mean very different things to men and to women. The epigraphs of Smith (1982) and Sutton-Smith may *both* be true.<sup>8</sup>

The play as a signal theory leads to several obvious hypotheses. First, playful men should be preferred over dour men as potential mates by women. Playful adult men should have, on average (as mitigated by cultural standards for family size, etc.) more children than dour men, crossculturally. Playful adult men should be less apt to engage in both wife battering and infanticide. Similarly, playful women should be preferred, cross-culturally, over dour women as potential mates by men. Playful women should have, on average (again mitigated by cultural standards), more children than dour women. Unfortunately, these hypotheses suffer from the same difficulty as many of the other conjectures about the origins and functions of play: some measure of logic, but little in the way of evidence. Further, even if play now serves as a signal for both men and women (and male and female animals), there is no guarantee that it evolved for that reason. Nevertheless, I feel that research in this area is worthwhile and that testable hypotheses are available. And, frankly, the speculating on the role of natural selection in the ontogeny of play, given the modest results realized so far, gets pretty boring after a while. Sexual selection theory, with visions of men competing for women with fancy clothes, sleek cars, and gifts that betoken boundless resources while women lure men with perfumes, figure-enhancing clothes, and makeup that promise both fecundity and eternal youth, seems like a lot more fun. It is the stuff of cheap novels. It might even be true.

## NOTES

1. To be fair, Smith (1995) has more recently expressed some doubts about the functions of play, especially in humans.

2. Human brain size remains an enigma. The brain is an energetically costly and relatively fragile organ. Yet, the brain size of present-day humans is essentially no different from that of archaic humans of 50,000 to 150,000 years ago. Since, so far as we know, all humans subsisted by food collection up until 12 or 15 thousand years ago, the adaptive significance and the evolution of the

big brain is difficult to explain. To assume that bigger brains must have been adaptive since they obviously did evolve is not very helpful. We simply do not know the nature of the selective pressures that resulted in big brains.

3. As noted by Buss (1989), there is a difference between *reproductive value* and *fertility*. A 13-year-old female has greater reproductive value than a 23-year-old, simply because she has, more or less, 10 years longer to be reproductively active. On the other hand, since fertility peaks in the early 20s, the 23-year-old is more likely to conceive and is, therefore, more fertile. Nevertheless, both reproductive value and fertility are age dependent, so age provides a clear indicator of female reproductive capability. But since the distinction between reproductive value and fertility is not critical to my argument, I use the term fertility to refer to both.

4. Of course, it could signal too much youthfulness. That is, since play is characteristic of juveniles, it might signal sexual immaturity, rather than fertility (though that might simply suggest a preference for reproductive value over fertility (see Note 3 above). Further, given the reasoning presented, it should be more important among females than males.

5. It is apparently common among certain species in every major animal group, including insects, fish, reptiles, birds, and mammals (Wrangham & Peterson, 1996).

6. Dagg (1998) has forcefully argued that infanticide by male lions is much less common than indicated by Packer and Pusey (1983, 1984). In addition, she claims that male lions who do kill cubs rarely, if ever, assume the role of dominant males in the pride of the victims and thus fail to take biological advantage of their infanticide. Finally, Dagg holds that models of infanticide based on lion behavior are inappropriately generalized to humans. On the other hand, she does not dispute the work of Hrdy (1974, 1978, 1979) on infanticide in langurs, a species more closely related to humans in any case, or among other animals. Across primates, an overwhelming majority of infanticides are perpetrated by males from outside the social group of the victim, according to Struhsaker and Leland (1986).

7. Ghiselin (1982) claimed that “artificial selection is closely akin to sexual selection” (p. 165). This is true to the extent that neither has much to do with selecting for survivability, Darwin’s primary interest in *Origin of Species* (1859). On the other hand, artificial selection has little to do with survival or reproduction per se except that we humans either consciously or unconsciously choose which individuals of certain species are permitted to survive *and* reproduce. In artificial selection, we are most interested in either physical or behavioral characteristics (i.e., large cereal grains, meaty pigs, birds that cannot fly but can produce prodigious numbers of eggs, or playful dogs). In many cases, we artificially breed varieties of organisms (e.g., most grain crops) that cannot successfully breed at all without human intervention. But sexual selection, as Ghiselin (1989) himself pointed out, is all about reproduction. Moreover, I am predicting that females select playful males, in part, for reasons that may be different from the ones for which males select playful females. Finally, since artificial selection typically refers to human intervention in breeding, by definition, it is excluded as an explanation for play among

non-domesticated animals. While I do not discount the possible roles of either natural or artificial selection in the ontogeny of play, my bet is that the evolution of play has more to do with sexual than artificial selection.

8. The other logical possibility is that both are wrong, an alternative that also must be considered.

## REFERENCES

- Aldis, O. (1975). *Play fighting*. New York: Academic Press.
- Andersson, M. (1982). Female choice selects for extreme tail length in a widowbird. *Nature*, 299, 818–820.
- Baldwin, J. D., & Baldwin, J. I. (1976). Effects of food ecology on social play: A laboratory simulation. *Zeitschrift für Tierpsychologie*, 40, 1–14.
- Barash, D. P. (1979). *The whisperings within: Evolution and the origins of human nature*. New York: Penguin Books.
- Bekoff, M. (1974). Social play and play-soliciting by infant canids. *American Zoologist*, 14, 323–340.
- Bekoff, M. (1975). The communication of play intention: Are play signals functional? *Semiotica*, 15, 231–239.
- Bekoff, M., & Allen, C. (1998). Intentional communication and social play: How and why animals negotiate and agree to play. In M. Bekoff & J. A. Byers (Eds.), *Animal play: Evolutionary, comparative, and ecological perspectives* (pp. 97–114). Cambridge: Cambridge University Press.
- Bekoff, M., & Byers, J. A. (1981). A critical reanalysis of the ontogeny and phylogeny of mammalian social and locomotor play: An ethological hornet's nest. In K. Immelmann, G. Barlow, M. Main, & L. Petrinovich (Eds.), *Behavioral development* (pp. 296–337). Cambridge: Cambridge University Press.
- Bekoff, M., & Byers, J. A. (1998). *Animal play: Evolutionary, comparative, and ecological perspectives*. Cambridge: Cambridge University Press.
- Bernstein, I. S. (1982). Hypotheses about play. *Behavioral and Brain Sciences*, 5, 158.
- Bolk, L. (1926). *Das problem der Menschwerdung*. Jena: Gustav Fischer.
- Burghardt, G. M. (1982). Comparison matters: Curiosity, bears, surplus energy, and why reptiles do not play. *Behavioral and Brain Sciences*, 5, 159–160.
- Burghardt, G.M. (1984). On the origins of play. In P. K. Smith (Ed.), *Play in animals and humans* (pp. 1–41). London: Basil Blackwell.
- Burghardt, G. M. (1998). The evolutionary origins of play revisited: Lessons from turtles. In M. Bekoff & J. A. Byers (Eds.), *Animal play: Evolutionary, comparative, and ecological perspectives* (pp. 1–26). Cambridge: Cambridge University Press.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1–49.
- Buss, D. M. (1994). *The evolution of desire: Strategies of human mating*. New York: Basic Books.
- Caro, T. M. (1988). Adaptive significance of play: Are we getting closer? *Trends in Ecology and Evolution*, 3, 50–53.
- Dagg, A. I. (1998). Infanticide by male lions hypothesis: A fallacy influencing research into human behavior. *American Anthropologist*, 100, 940–950.

- Daly, M., & Wilson, M. (1980). Discriminative parental solicitude: A biological perspective. *Journal of Marriage and the Family*, 42, 277–288.
- Daly, M., & Wilson, M. (1984). A sociobiological analysis of human infanticide. In G. Hausfater & S. B. Hrdy (Eds.), *Infanticide: Comparative and evolutionary perspectives* (pp. 487–502). New York: Aldine.
- Daly, M., & Wilson, M. (1985). Child abuse and other risks of not living with both parents. *Ethology and Sociobiology*, 6, 197–210.
- Daly, M., & Wilson, M. (1987). Children as homicide victims. In R. J. Gelles & J. B. Lancaster (Eds.), *Child abuse and neglect: Biosocial dimensions* (pp. 201–214). New York: Aldine.
- Darwin, C. (1859). *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. London: John Murray.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: John Murray.
- Durham, W. H. (1991). *Coevolution: Genes, culture, and human diversity*. Stanford, CA: Stanford University Press.
- Ellis, B. J. (1992). The evolution of sexual attraction: Evaluative mechanisms in women. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 267–288). New York: Oxford University Press.
- Fagen, R. (1981). *Animal play behavior*. New York: Oxford University Press.
- Fagen, R. (1982). Skill and flexibility in animal play behavior. *Behavioral and Brain Sciences*, 5, 162.
- Fagen, R. (1992). Play, fun, and communication of well-being. *Play & Culture*, 5, 40–58.
- Fagen, R. (1995). Animal play: Games of angels, biology, and Brian. In A. D. Pellegrini (Ed.), *The future of play theory* (pp. 22–44). Albany: State University of New York Press.
- Ghiselin, M. T. (1974). *The economy of nature and the evolution of sex*. Berkeley: University of California Press.
- Ghiselin, M. T. (1982). On the evolution of play by means of artificial selection. *Behavioral and Brain Sciences*, 5, 165.
- Ghiselin, M. T. (1989). Darwinism versus neo-Darwinism in the study of human mate preferences. *Behavioral and Brain Sciences*, 12, 20.
- Goldsmith, T. H. (1991). *The biological roots of human nature*. New York: Oxford University Press.
- Gould, S. J. (1989). *Wonderful life: The Burgess Shale and the nature of history*. New York: W. W. Norton.
- Gould, S. J. (1996). *Full house: The spread of excellence from Plato to Darwin*. New York: Random House.
- Gould, J. L., & Gould, C. G. (1997). *Sexual selection: Mate choice and courtship in nature*. New York: Scientific American Library.
- Gould, S. J., & Lewontin, R. C. (1979). The spandrels of San Marco and the Panglossian paradigm: A critique of the adaptationist program. *Proceedings of the Royal Society of London B, Biological Science*, 205, 581–598.
- Gould, S. J., & Vrba, E. S. (1982). Exaptation—A missing term in the science of form. *Paleobiology*, 8, 4–15.

Haines, S. E., & Gould, J. L. (1994). Female platys prefer long tails. *Nature*, 370, 512.

Hall, S. L. (1998). Object play by adult animals. In M. Bekoff and J. A. Byers (Eds.), *Animal play: Evolutionary, comparative, and ecological perspectives* (pp. 45–60). Cambridge: Cambridge University Press.

Hrdy, S. B. (1974). Male-male competition and infanticide among the lemurs (*Presbytis entellus*) of Abu Rajasthan. *Folia Primatologica*, 22, 19–58.

Hrdy, S. B. (1978). Allomaternal care and the abuse of infants among Hanuman langurs. In D. J. Chivers & P. Herbert (Eds.), *Recent advances in primatology* (Vol. 1). New York: Academic Press.

Hrdy, S. B. (1979). Infanticide among animals: A review classification and implications for the reproductive strategies of females. *Ethology and Sociobiology*, 1, 13–40.

Lawick-Goodall, J., van. (1968). The behaviour of free-living chimpanzees in the gombe Stream Reserve. *Animal Behaviour Monographs*, 1, 161–311.

Lazell, J. D., Jr., & Spitzer, N. C. (1977). Apparent play in an American alligator. *Copeia*, 1977, 188.

Lewis, M. (1982). Play as whimsy. *Behavioral and Brain Sciences*, 5, 139–184.

Lewontin, R. C. (1979). Sociobiology as an adaptationist program. *Behavioral Science*, 24, 5–14.

Low, B. S. (1979). Sexual selection and human ornamentation. In N. A. Chagnon & W. Irons (Eds.), *Evolutionary biology and human social behavior: An anthropological perspective* (pp. 462–487). North Scituate, MA: Duxbury Press.

Malthus, T. R. (1803). *An essay on the principle of population*. London: J. Johnson. (Original work published 1798)

Martin, P., & Caro, T. M. (1985). On the functions of play and its role in behavioral development. *Advances in the Study of Behavior*, 15, 59–103.

Mayr, E. (1997). *This is biology: The science of the living world*. New York: Belknap Press.

Müller-Schwarze, D., Stagge, B., & Müller-Schwarze, C. (1982). Play behavior: Persistence, decrease, and energetic compensation during food shortage in deer fawns. *Science*, 215, 85–87.

Packer, C., & Pusey, A. (1983). Adaptations of female lions to infanticide by incoming males. *American Naturalist*, 121, 716–728.

Packer, C., & Pusey, A. (1984). Infanticide in carnivores. In G. Hausfater & S. B. Hrdy (Eds.), *Infanticide: Comparative and evolutionary perspectives* (pp. 31–42). New York: Aldine.

Pellis, S. M., & Pellis, V. C. (1996). On knowing it's only play: The role of play signals in play fighting. *Aggressive and Violent Behavior*, 1, 249–268.

Pellis, S. M., & Pellis, V. C. (1998). The structure-function interface in the analysis of play fighting. In M. Bekoff & J. A. Byers (Eds.), *Animal play: Evolutionary, comparative, and ecological perspectives* (pp. 115–140). Cambridge: Cambridge University Press.

Poirier, F. E. (1982). Play—immediate or long-term adaptiveness? *Behavioral and Brain Sciences*, 5, 167–168.

Ridley, M. (1993). *The red queen: Sex and the evolution of human nature*. New York: Penguin Books.

Service, R. F. (Ed.) (1998). Random samples: Suckers for fun. *Science*, 281, 909.

Sigmund, K. (1993). *Games of life: Explorations in ecology, evolution and behaviour*. Oxford: Oxford University Press.

Smith, P. K. (1982). Does play matter? Functional and evolutionary aspects of animal and human play. *Behavioral and Brain Sciences*, 5, 166.

Smith, P. K. (1995). Play, ethology, and education: A personal account. In A. D. Pellegrini (Ed.), *The future of play theory* (pp. 3–21). Albany: State University of New York Press.

Struhsaker, T. T., & Leland, L. (1986). Colobines: Infanticide by adult males. In B. B. Smuts, D. L. Cheney, R. M. Seyfarth, R. W. Wrangham, & T. T. Struhsaker (Eds.), *Primate societies* (pp. 83–98). Chicago: University of Chicago Press.

Suomi, S. J. (1982). Why does play matter? *Behavioral and Brain Sciences*, 5, 169.

Symons, D. (1978). *Play and aggression: A study of rhesus monkeys*. New York: Columbia University Press.

Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the Descent of Man* (pp. 136–179). Chicago: Atherton.

Wrangham, R., & Peterson, D. (1996). *Demonic males: Apes and the origins of human violence*. New York: Mariner Books.

Page 26

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## **Chapter 2 Reframing the Variability of Players and Play Brian Sutton-Smith**

### **INTRODUCTION**

This chapter reviews the variabilities of play to be found in the rhetorics, theories, and forms of play, as well as in the types of players. The role of such play variations in adaptation is pursued in terms of biological “fitness” arguments and in terms of the cultural and psychological reinforcements that sustain the playforms to those ends. The paradox presents itself that though play inverts human adaptive technologies, the inversions themselves become an ultimate form of “fitness.”

### **PART I: EVIDENCES OF VARIABILITY**

#### **Diverse Rhetorics**

The book *The Ambiguity of Play* (Sutton-Smith, 1997) contends that there are at least seven play rhetorics, each of which includes an aggregation of different play theories and play forms. The modern rhetorics are that play is about:

1. Progress, which includes socialization theories about animal and children’s play largely by psychologists, sociologists, and biologists.
2. The imaginary, which includes play formulations by literary and art theorists about the imagination as well as formulations about play as pretense, flexibility, and creativity across a variety of disciplines.
3. Unique experiences of the self that are voluntary, free, intrinsic, flow, and actualization, which are all contemporary forms of consumer individualization found across multiple disciplines, but in particular the leisure sciences.



The ancient rhetorics say that play is about collective uses of:

1. Power of either physical or strategic kinds, of rational or irrational kinds, as in sports or football riots, with a variety of theories by historians, classicists, mathematicians, and anthropologists.
2. Collective identity as represented in festivals and carnivals, and studied largely by historians, anthropologists, and folklorists.
3. Fate, which refers to games of chance and gambling and has been studied mostly by economists, statisticians, and psychiatrists.
4. Frivolity, which refers to the activities of clowns, comedians, tricksters, jokesters, fools, jesters, and harlequins, and again, is the focus for historians and folklorists.

The first three of these—progress, the imaginary, and the self—are largely 20th-century theoretical elaborations, but the final four—power, identity, fate, and frivolity—are located throughout human history.<sup>1</sup>

## DIVERSE PLAYERS

The deconstructive pluralism or contextualization of play theorization implied by these rhetorics can be taken even further if we pay attention to the great differences in the kinds of player experience that are also available. My own attention to these possibilities was brought about by trying to understand why it is that recently so many kinds of modern professional players have become celebrities and some of them are being paid for their play skills in the range of hundreds of millions of dollars. It's not that there isn't any record of high acclaim in prior centuries for "play" celebrities, but it certainly never had the wide range of this current scale. I was particularly impressed, for example, that Jerry Seinfeld, playing the role of a *humorist*, made more than \$400 million/year during the height of his television show's popularity. It was also provocative that various *novelists* such as Grisham, Crichton, and King were in the same high multi-million-dollar range as were indeed several *film stars* and several *film directors*. It was not so surprising perhaps that there were *athletes* like Jordan and Holyfield in this league. But to find a television talk-show host such as Oprah Winfrey in this class was again a novelty. Other types of celebrities who have built their child play into fortunes are some *artists*, *collectors*, and *explorers*.

What occurred to me was that those of us in developmental psychology have never studied child play as an antecedent to these successful forms of adult professional play. The emphasis over this century, rather, has been on the way in which child play contributes to adult seriousness of moral, social, affective, and cognitive kinds. There has seldom been any study of the consequences of child playfulness for adult playfulness and

yet, as this dollar data indicates, some child players grow up to be play professionals and make huge fortunes. A skeptic might ask, therefore, why does play need any more excuse than this? Why does it have to be studied only in terms of its transfer value to other kinds of development when such massive continuities seem to be present in some cases between child and adult play? Presumably, in these cases, their original child play has now become their work ethic and needs no other justification. Relevant at this point is the work of Howard Gardner, called *Frames of Mind* (1983), in which he puts aside the notion of the existence of only one general kind of intelligence and calls attention instead to the different kinds of intelligent geniuses that have characterized human history, in particular those who expressed their brilliance in words, music, logic, spatial thinking, kinesthetic ability, or social insight. Perhaps it follows from Gardner's example that the next step for play research is to focus on the special kind of players in childhood who can be seen to be budding humorists, explorers, athletes, actors, novelists, gamesters, artists, hostesses, models, and so on. The problem with this proposal, however, is the relative lack of useful data. Most play studies have been normative, and not idiographic, so there is little data on the case histories of the budding potential "professional" players of childhood.

What follows, therefore, are some very preliminary suggestions about some of the play domains that await their idiographic research destiny. It may be protested by some that child play study should be limited to children's own play forms and not to whatever antecedents of professional play they may manifest. But given the general lack of knowledge of the effects of a disposition or enculturation toward being a humorist (or an athlete, and so on), the relevance of any play content to this or any other outcome is presently an empirical issue. The hypothesis that is assumed here is that anyone who becomes a professional player such as a comedian, explorer, actor, narrator, athlete, collector, hostess, model, or artist of any kind, inevitably plays with these mental and behavioral play frames at earlier ages, and probably maintains playful accompaniments during their artistic involvement even at the adult stage. This is, however, also an empirical question yet to be settled. In the following treatment of some of the hypothesized individual play persona, several of them are dealt with fairly fully to indicate the issues at hand. Others are simply named at this point with the further recognition that there may be yet others, not yet named, that will also have to be considered.

#### *The comedians*

There is a history of famous comedian-type professional play persons, such as clowns, jesters, harlequins, fools, tricksters, and jokers. In one form or another, they are among the most pronounced players in our lives. Whether we see them in film, on stage, in a tavern, or hear from them on

the Web, they continue to be one of humankind's most universal types of players. Consider the Marx Brothers, Charlie Chaplin, the Keystone Cops, Bob Hope, Jack Benny, George Burns, Jonathan Winters, Robin Williams, Jerry Seinfeld, and Jim Carrey just to skim a few of the more famous with whom we are familiar. These people really exist in the same sense that geniuses really exist and it behooves us in consequence to attend to the developmental antecedents that help to bring them about. As a type of character, these jokers mix up in their performances the differences between right and wrong, decent and indecent, clean and dirty, male and female, young and old, living and dead, and between the sacred and the ordinary (Hyde, 1998). While laughter is the main outcome of the modern joker, historically the function of jesters and fools in the royal courts was also to shake up old ideas and bring in new ideas. Jesters then, as comedians today, often made the listener aware that things can be different than they seem. A joker can criticize the king or president while seeming to make a joke about something else. Today jokes can be quite direct. No one loses his head for a bad joke anymore, though they might not be invited back to your house again. There are legends that on occasions when the king died during the yearly one-week festival reign of the joker, then the joker became the next king (though that was probably less likely than a senator's wife in our day becoming the next senator when he dies, which, as we know, happens). In earlier times, during the Christmas season, a Lord of Misrule was in charge of all the parties and foolish pranks to guarantee that the festival season was a lively one. There was another British festival of the middle ages in which, for a day, a boy was made the bishop and would carry out all of the church functions in a playful way while he was in office. On our own soil, the Hopi Indians yearly chose a child clown who became the center of attention during the festival time and was allowed to laugh and joke and say anything that came into his mind. It would be taken as serious prophesy.

It can be argued that the most basic form of social play is always some kind of nonsense. Even babies begin with nonsense. In the first six months there is practically no way of making them laugh unless one becomes something of a clown. One must make faces, blow raspberries, talk with elongated high-pitched sounds, jump up and down, fall over, and generally be something of a fool if there is to be mutual fun (Sutton-Smith & Sutton-Smith, 1974). It is not an accident that almost every time Piaget cites an observation of play in the first year of life, he uses the child's smiling or laughter as his evidence that it is indeed play that is taking place. Some have criticized him for making play so implicitly dependent on humor, but as long as humor is regarded, essentially, as among the most primary of playforms, there is no necessary contradiction. To date, the normative history of laughter has been traced in the scholarly terms of psychoanalysis (Wolfenstein, 1954) and of cognition (McGhee, 1979). It is largely in the

psychiatric literature, however, that we get a touch of the case studies that may be relevant to the present undertaking, although even here there is usually some overriding explanation which is meant to cover all cases. Thus Fisher and Fisher (1981) cogently suggest that child humorists develop in a family in which there is conflict between required surface propriety and its underlying rejection. Such humorous characters are said to be reared in highly respectable homes where impolite behavior would not be acceptable. But subsequently they get respect for their disrespectful follies from the laughing audiences that support them. In many ways, the humor of Seinfeld is an apparently supportive case with its mockery of forms of politeness in urban adult society. His characters remain permanently adolescent in their amusing egocentricities. On the other hand, this conflict-centered theory is not how Seinfeld accounts for himself. According to a recent biography, he claims to have directly modeled himself after his father who, as a salesman, was always trying to overcome the clichés of his business by making unique statements to his potential buyers. “The thing I remember most about those afternoons is how often my father would say to me: ‘Sometimes I don’t even care if I get the order, I just have to break that face.’ He just has to get a laugh” (Cawley, 1998, p. 39). So whether Seinfeld is himself propelled by a conflict over respectability with his parents, as the Fishers might argue, or more straightforwardly, by modeling the example of his father, remains uncertain. Interestingly, in Jim Carrey’s case, the father also plays a dominant role in modeling the madness of facial humor which is Carrey’s speciality.

One might hypothesize, however, unlike the developmentalist or the psychiatrist, that there are always multiple reasons why anyone begins to develop as a humorist, even if only because there are quite different kinds of humorists and different ways in which people tell jokes. Some are slow and secretive; others are extroverts—witty and quick; some are cartoonists, columnists, practical jokers; some prefer obscene humor, riddles, limericks, ethnic jokes, violence, and so on. Given that we are all genetically unique and variable in personality, it seems improbable that we would all become celebrity humorists for the same reasons. Which is to say that there is a very good case for the longitudinal study of the diverse role of humor in the lives of a sample of children. How do they individually show it? How does it appear in their families, with their peers, and in their institutions (school, church, etc.)? What kind of a competence is it? Research might begin with a review of the kinds of humor scholarship as offered by Nilsen in his (1993) *Humor Scholarship: A Research Bibliography*. There are, it turns out, innumerable child-related humor research papers on such topics as laughing with children, funny teachers, jokes and political socialization, humor and Piaget’s theory, making children laugh, and another 600 or so references. Unfortunately, there are no longitudinal studies on the growth play histories of humorous children.

*The explorers*

Explorers, or the *discoverers*, as Borstin terms them (1983), can be involved in the physical world or in the mental world. They can be microexplorers with scientific instruments, microscopes, X-rays, and so on, or macroexplorers finding other countries or going into space. Names such as those of Magellan, Marco Polo, Hillary, Tensing, Copernicus, Harvey, Darwin, Einstein, and Freud indicate some of the parameters of this domain of play at the adult level. Obviously, some of these people are also intellectual geniuses, but the interest here is whether their genius is also manifest in a characteristic play form. If we shift to child development issues, we can contend that exploration is the most basic way in which children learn anything. It is what babies do when they first look at their own fingers or at the toys that are near them. Very young children closely examine objects to see what they can do with them and then go on to make them do whatever it is they want them to do, for fun. This is what is usually called their play but might better be called their tinkering because it is both exploration and play at the same time. What they first examine for knowledge is next used for making fun. A baby first examines a rattle carefully and shakes it vigorously, looking at it in a puzzled way because of the noise it makes. But after some repeats of this puzzled looking, the baby rattles it again and again but with a smile all over her face. It has been investigated and its function has been discovered; now the baby is proud of herself, because she can make it make noises just to show how smart she is. Likewise, when new toys are introduced to children, they first want to explore them seriously, to discover how they can make them work. But after they have checked them out for a while, they will begin to play with them (Sutton-Smith, 1986).

But do we have any account of the history of how individuals play with their toys and how these microexplorations (puzzles and blocks) or macroexplorations (bicycles and skates) vary and change with their development? The answer is largely negative. Most studies of toys are of toy history (for example, Frazer, 1996; McClary, 1997), others are of the history and functions of the modern toy industry (Cross, 1997), and others are of the different cultural functions that toys serve in an anthropological sense (Sutton-Smith, 1999). A book by Kuznets, *When Toys Come Alive* (1994), on the role of toys in children's literature, has many illustrations of ways in which toys might have functioned in children's lives; and Sutton-Smith (1986) has illustrations of the way children say they play with toys at different ages, but neither of these is the longitudinal analysis over time of toy play by individuals that is being advocated here. Still, toys are only a modern way in which object exploration takes place. We have records of object play (mud, stones, twigs, flowers, etc.) in the anthropology of nomadic play, and even in the play of animals, so object play is a longstanding juvenile phenomena and the more general category of which toys are just a part. Another concern for children in the modern world has to be the contrast