CHAPTER 11

The Development of Play

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INTRODUCTION

Children spend many of their waking hours engaged in play, and this is frequently claimed to be crucially important to children's development (Lillard et al., 2013; Wilson, 1975). Despite these facts, since the first edition in 1946 of what is often referred to as the "Mussen Handbook of Child Psychology," only one previous chapter has been accorded to the development of play (Rubin, Fein, & Vandenberg, 1983). Although there has been much research on play since that prior chapter, the role of play in development is still not well understood. Some of the best research on its role comes from ethological and comparative perspectives (Bekoff & Byers, 1998; Pellis & Pellis, 2007). These perspectives are typically concerned only with play fighting, the variety of social play that is most characteristic of nonhuman animals. In humans, the bulk of research and theory concerns symbolic or pretend play, in which children act as if one object or situation is another, including taking on and acting out roles. In short, play is a major activity for children, and although we have learned much about play in the past 30 years, several crucial mysteries still remain.

In this chapter I begin by discussing how play is defined, because play is a particularly nebulous concept. Next I discuss the major theories of children's play, followed by an overview of the developmental course of play across childhood. The third major section covers some contemporary debates and developments in play research, many of which concern pretend play. These include pretend play's relation to theory of mind and symbolic understanding,

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children's ability to discriminate between fantasy and reality, what role pretend play has in development, and how children get initiated into the practice of pretend play. The next section discusses broad group differences in play that emerge according to gender, culture, and atypical development (visual impairment, for example). Although throughout the chapter I point out issues that should be addressed in further research, the final section highlights some concerns that I think are especially likely to generate productive research in the coming decades.

The major theoretical perspective I take in this chapter is social-cognitive. From this perspective, I view play in terms of what it reveals about children's cognitive capacities and in terms of how it might contribute to cognitive (and other) advances across childhood. Yet, as compared to traditional cognitive development approaches that tended to pay little heed to social context, in taking a social-cognitive perspective I attend closely to how the social environment contributes to and frames these developments. I also adopt ethological and functionalist perspectives in some sections. Ethological perspectives stem from comparative biology. When taking an ethological perspective I consider how behavior patterns might have been selected for over evolutionary time scales because those behaviors enhance survival and, ultimately, reproductive fitness. When taking a functionalist perspective, I consider the more immediate functions play behavior might have for the organism.

DEFINING PLAY

Most treatments of play begin with considering how play is defined, because play is a very "fuzzy concept" (Lakoff, 1973), lacking clear intension (definition) and extension (the set of all instances of a concept). Indeed, Fagen (1981) included five pages' worth of different definitions of play, taken from a variety of texts on the subject, for his classic book on animal play. The difficulty of defining play becomes clear when considering a few examples of child and animal behaviors: (1) An 11-month-old girl shakes her head, and then her father shakes his head. She laughs uproariously and shakes hers again, then watches her father intently. (2) A 3-year-old dresses a toy stuffed cat in a doll outfit and lays out a miniature tea set. He proceeds to pour and drink "tea" while also holding a cup to the cat to "drink." (3) A group of neighborhood children spontaneously engage in a game of stickball, designating roles and locations, then beginning to bat and run. (4) Two dogs approach each other and one bends down in front, exercising a "play bow" (Bekoff, 1995). The other pounces and knocks the first one down, then nips at its ear, not fully closing its jaws. (5) A cat jostles a small ball, making it roll away, then pounces upon it. Most people would consider all these to be instances of play, but on what basis? Finding a strict set of criteria by which to classify examples of play has proven difficult.

An early approach adopted by both Piaget (1962) and several ethologists (Bekoff & Byers, 1998; Fagen, 1981; Groos, 1898, p. 84*ff*) was to define play according to behavioral categories; Piaget's were sensorimotor play, symbolic play, and games with rules. Sensorimotor play involves repetitive interactions with an object or one's body with no apparent purpose besides sensory and motor stimulation, as is shown by the 11-month-old just described (example 1). Yet other activities that fit this bill do not classify as play. For example, when an adult jiggles his or her foot, one would not typically categorize the behavior as sensorimotor play, although the act does fit the definition of repetitive interactions with one's body with no apparent purpose besides sensory and motor stimulation.

Symbolic play is characterized by using one object to stand for another; the 3-year-old using the stuffed cat to stand for a person as in example 2 exemplifies symbolic play. Yet object substitution is not always pretend. If one uses a pen to stir coffee, one is not likely *pretending* that the pen is a spoon (see Perner, 1991). One distinction between these two acts is that the latter substitution is done with a real-world goal to dissolve the sugar. Yet sometimes pretending is also done with a real goal. For example, an older sibling might engage a younger one in playing maids in order to accomplish a real chore of cleaning house. Hence again, the behavioral category definition fails to specify the extension of the activity.

The group of children playing stickball (example 3) corresponds to Piaget's third category of play, games with rules. But as stickball merges into a Little League game, then a college and finally a professional baseball game, at some point it ceases to be a "game with rules" and becomes work. At what point does this occur, and why? Piaget's three behavioral categories do not make clear why we consider some behaviors play, and not others.

Ethological approaches to play also rely on behavioral definitions, often dividing play into categories of locomotor, object, and social (Fagen, 1981). A great deal of animals' play consists of highly stylized pseudo fighting and predatory behaviors. For example, the play bow noted above is a common play fighting behavior among canids that occurs in a predictable sequence across individuals and

instances of play (Bekoff, 1977). From an ethological perspective, one candidate defining feature of play behaviors is that the actual behavior is not carried to its completion: no player is actually injured in a play fight, and the play object (the cat's ball above) is not actually consumed in play predation. The truncated play behavior is beneficial to the organism's survival because the organism practices many elements of fighting without actually getting hurt. However, a "truncated behavior" definition leaves out some cases we would call play—like the two children who pretend they are maids while really, and completely, cleaning the house.

Perhaps the essential problem in using observable categories to define play is that behavioral categories fail to encompass psychological aspects that many would say are the key determinants of play. For example, it is hard to say when a child begins symbolic play because symbolic play is not always clearly distinguished by behaviors, but rather by something psychological (Lillard, 1993a). The housekeeping example just given is one such case: The behaviors one engages in when playing maids might be indistinguishable from the behaviors one engages in while actually cleaning house; what distinguishes the two events is how one mentally represents the situation. Another example occurs when a child puts a spoon to a toy duck's mouth. The child might be pretending to feed the duck, or might be demonstrating a prominent location goal for a spoon. What distinguishes these two behaviors, making the former and not the latter a case of play, is the child's psychological state. If the child is engaging in the spoon-to-mouth behavior in order to demonstrate a prominent location goal for a spoon, the child's behavior is properly called "functional behavior." Functional behaviors are sometimes indistinguishable from pretend play, particularly early in development (Huttenlocher & Higgins, 1978). Hence what distinguishes play is sometimes psychological; the behavior alone is not discriminatory. This is problematic for the behavioral category approach taken by Piaget and the ethologists.

Another way of defining play is according to the functional disposition with which activities are engaged. One candidate functional disposition is that the behavior is intrinsically motivated (Berlyne, 1960): it is done for one's own sake (2009). Another is that in play, one privileges means relative to ends (Bruner, 1972), and yet another is that play activity emphasizes subjective experience ("What can I do with this object?" as opposed to "What can this object do?"; Hutt, Tyler, Hutt, & Christopherson, 1989). Having an "as-if" element has also been considered a defining dispositional characteristic of play (Garvey, 1990). Piaget (1962), in addition to giving the behavioral categories just mentioned, also put a high priority on the dispositional characteristic of pleasure. These dispositional criteria all suggest that the function of the play activity is other than achieving some goal. Yet again, the criteria fail to specify the extension of play: There are other, nonplay activities which people engage in for secondary purposes.

Rather than laying out specific criteria that must be satisfied for a behavior to qualify as play, Krasnor and Pepler (1980) suggested that all behaviors lie along a continuum from fully playful to not playful. They posited four criteria: (1) The behavior is intrinsically motivated. (2) The behavior is nonliteral, or lacks its ordinary meaning. (3) The organism displays positive affect while engaging in the behavior. (4) There is flexibility in the form and content of the behavior. The more criteria were fulfilled, the further on the playful end of the continuum a behavior was located. P. K. Smith and Vollstedt (1985) empirically tested whether this definition of play was compatible with adults' intuitive views of play. Seventy adults were shown videotaped scenes of children playing and were asked either to categorize each scene as play or not, or to rate each scene on the four criteria above, plus a fifth criterion: "More concerned with means than ends." The authors then searched for convergences among the behaviors classified as play by the one set of 35 raters and the criteria chosen as characterizing the behaviors by the other 35 raters. The nonliteral, positive affect, and flexibility attributes (Criteria 2–4) best predicted play categorization. One caveat to the method, and thus to claiming that these three criteria are the best for defining play, is that videotaped scenes might eliminate some additional criteria by which one might judge a naturally occurring scene to be play (Pellegrini, 2009). A second issue is that some instances of play might be missed if being on the higher end of these three continuous criteria is required. For example, children might display no positive affect at all while playing scary monsters. Although positive affect is often a great signal to play, it occurs in many nonplay situations and does not always appear in play.

A more recent approach to defining play is that of Burghardt (2005, 2011), which sets out five criteria, all of which an activity must meet to qualify as play. Some of Burghardt's criteria are quite broad, and they encompass both structural and functional criteria—in other words, both the behavior's form, and what the behavior does for the organism. The two structural and three functional criteria are, respectively: (1) The behavior is incomplete, exaggerated, awkward, precocious, occurs in a modified sequence, or is aimed at a target that is atypical

for the activity. (2) The behavior is repeated in a similar but not rigidly stereotyped way. (3) The behavior is not fully functional in that it is not primarily aimed at the survival of the organism. (4) The behavior is spontaneous, voluntary, pleasurable, rewarding, intentional, or autotelic (for the self). (5) The behavior occurs under ample conditions, as opposed to under stress. The organism is in a "relaxed field."

Burghardt's approach allows one to correctly classify many behaviors that intuitively seem like play or not-play. However, Criterion #5 seems questionable in the realm of human play. For example, children in concentration camps—surely a stressful situation—engaged in pretend play (Gray, 2013). In fact, children have been observed to engage in pretend play even more when under stress than when not stressed (Barnett & Storm, 1981). Piaget (1962) also noted that play sometimes involves "symbolic reproductions of painful experiences" with the sole aim of digesting and assimilating them (Obs. 86; p. 149). Although criteria #5 is often true for animals (but see Pellis & Pellis, 2009), human children also play when stressed.

In sum, defining play is challenging because the term encompasses a wide variety of behaviors with no single shared criterion. Piaget and ethologists have both taken the approach of describing observable behaviors that constitute play, but they do not make clear why some instances of behavior and not others are considered play. Several others tried various functional and dispositional criteria that were ultimately unsatisfactory. An experiment using a continuum approach showed that the more a behavior was seen to be nonliteral, characterized by positive affect, and flexible, the more likely it was to be classified as play. More recently, Burghardt's list approach, although cumbersome and with one questionable criterion, is the most useful one yet for helping to establish a set of criteria for determining if a given behavior is play.

THEORIES OF PLAY

Piaget's and Vygotsky's theories of play dominate its discussion in child development today. Each is considered in turn.

Piaget

Piaget's (1962) theory of play specifies three types of play—the behavioral categories of sensorimotor, symbolic, and games with rules mentioned above—corresponding to the first three stages of his theory of human development. Each type of play behavior reflects the underlying mode of thought in its stage. Besides their behavioral forms, what particularly makes these behaviors *play* for Piaget is that they are engaged in for pleasure.

Sensorimotor Play

A child in the sensorimotor period plays by exercising sensory and motor capacities on the environment. For Piaget, this exercise is the major engine of development in this period, important for its exploratory aspects ("manual work is essential to the child's mental development," Piaget, 1962, p. 383, a stance Piaget traced to Montessori, see Lillard, 2005). As an example of this play, in Observation (Obs.) 59, Piaget (1962) described Laurent at just under 3 months old repeatedly throwing his head back and observing the world from this new angle, smiling and sometimes laughing as he did so. Such play behaviors begin in the second substage; in the third substage, the child begins to play with objects. Play behaviors develop through the Sensorimotor substages in accordance with the cognitive features Piaget described, until towards the end of the Sensorimotor period, play behaviors lead into symbolic thought.

This transformation to the internalization of "thought" begins with play behaviors becoming ritualized. For example, in Obs. 63, 12-month-old Jacqueline was holding her hair with her hand in the bath, when her hand slipped into the water and made a sound (Piaget, 1962). She proceeded to repeat this action many times, hitting the water in different ways to make different sounds. Piaget saw this as play because "the child's attitude showed that it was merely a question of ludic combinations" (p. 94). Ritualized actions prepare the child for symbolic play, in which one object represents another, because with such rituals meaning becomes separated from action. Thus, at 19 months, Lucienne "pretended to drink out of an empty box and then held it to the mouths of all who were present" (1962, p. 97, Obs. 65), something she had prepared for in the weeks prior by ritualistically pretend-drinking out of empty cups and making drinking noises with her mouth. By the end of the sensorimotor period, then, the rituals of play produce symbols, such as a box symbolizing a cup. Symbolic thought is of course the key cognitive advance of the preoperational stage, and is manifested in pretend or symbolic play.

Symbolic Play

In pretend play, assimilation of reality to the child is predominant; accommodation is minimal. The box is

assimilated to the child's desire for a cup, but the child accommodates to the box, for example, in how the box is gripped. Why do children do this? Piaget has been characterized as proposing that symbolic play helps development, for example, as having "concluded that play was a vital component to children's normal intellectual and social development" (D. L. Singer, Singer, DíAgostino, & Delong, 2009, p. 285). On another interpretation, however (see P. K. Smith, 2010, pp. 31–37), for Piaget, symbolic play was only "a preparation for imaginative aptitudes" (Piaget, 1962, p. 155), with imagination (as it is used in pretend play) being at the assimilative pole, and creative imagination arising when accommodation and assimilation come together in equilibrated thought. Symbolic play's function was egoistic: Children could not accommodate or adapt to reality, so they changed it to fit their desires and felt needs. A child who wanted more power could pretend to be a king or queen, for example. For Piaget, children outgrow pretending as they develop the ability to accommodate to reality. In this, Piaget aligned with contemporaneous child psychology luminaries like Freud (1955) and Montessori (1989), who also did not see pretend play as a useful activity for children (see Lillard, 2013). Sutton-Smith (1966), in fact, colorfully characterized Piaget's view of pretend play as "a buttress to an inadequate intelligence" (p. 108). Although Piaget (1966) responded to several aspects of Sutton-Smith's critique, he did not challenge this characterization.

Games With Rules

Games with rules emerge gradually during the Preoperational period, but occur predominantly in the Concrete Operational stage and beyond, for example in chess, cards, and sports games. Games with rules are characterized by competition and established regulations. These rules emerge from symbols in the context of social contracts. Some of those social contracts are the result of history; these are institutionalized rules, like the methods of scoring in tennis. Other rules can arise spontaneously, as when children make up new games. For example, in Obs. 94, Piaget (1962) described shepherd boys who made up a game in which small branches were split and made to represent cows, which then fought each other according to specific rules that the boys apparently devised on the spot. The "cows" had to stand horn to horn and push against each other, with no jerking or other "illegal" motions, until one fell.

In playing games with institutionalized rules, one is no longer mainly assimilating reality to the ego; accommodation (in this case to rules) carries equal weight. Thus, an equilibrium is reached in games with rules, in which there can be pleasure in terms of sensorimotor (as in tennis) or intellectual (as in cards) satisfaction, but also accommodation to rules that are specified in social life. For Piaget, engaging socially in games with rules could spur development because of the accommodation required to play with others whose rules might be different.

Summary

In sum, for Piaget, the development of play proceeds in tandem with the development of thought, from sensorimotor play through symbolic play to culminate in games with rules. In early play, assimilation dominates over accommodation (opposite to imitation), and play is characterized by "ludic" or pleasurable qualities, which are signaled by smiling and laughter. Piaget believed development initially occurs through the child's actions on the environment. Sensorimotor play is a major forum for such actions. Repetition of sensorimotor acts has a consolidating function, making sensorimotor play very important for development. Piaget did not believe symbolic play helped children with their primary developmental task of adaptation to reality. Yet he viewed the highest form of play, games with rules, as helping with development, because children need to develop equilibrium in the face of different perspectives on how games should be played.

Vygotsky

Vygotsky is the other major theorist frequently referred to in contemporary research on play. Whereas Piaget discussed three types of play behaviors corresponding to different stages of mental development, Vygotsky focused on just one type, symbolic play. Also in contrast to Piaget, Vygotsky (1978) did believe symbolic play had a crucial role in development: In symbolic play, children learn to separate referent from object. By contrast, for Piaget, symbolic play was evidence that a child had separated referent from object, but it was not a vehicle for learning to do so.

To elaborate, for Vygotsky, pretend play is the activity setting where children first understand that actions (and the objects on which the child acts) can be separated from reality, and that those actions might be based on the meaning of the imagined situation instead of the physical properties of the objects (Vygotsky, 1967). For example, a child can pretend a stick is a horse. In treating the stick as a horse, the child ignores or inhibits some of the stick's properties like its un-horse-like shape. Through

such acts, children develop abstract thought (Vygotsky, 1967). Play also helps children develop because they take on other roles, often including those of people older than themselves. By pretending to be a parent or a teacher, children learn to take the perspectives corresponding to those roles, and to behave according to their norms (see Rakoczy, Warneken, & Tomasello, 2008). Even solitary play, to Vygotsky, is bound by rules. Pretend play thus prepares children for adult life, pulling them up into their zones of proximal development. Because of these features, "In play, it is as though [the child] were a head taller than himself" (Vygotsky, 1978, p. 102).

Vygotsky (1978, 1990) continues to be very influential in discussions of pretend play and its possible role in development; his theory actually is more prominently discussed in the recent research literature than that of Piaget. Some other recent theories that focus mainly on pretend play, addressing, for example, its cognitive architecture and its role in development, are described as they arise later in the chapter. Further discussion of theories of play can be found in Pellegrini (2009) and P. K. Smith (2010).

VARIETIES OF PLAY AND THEIR DEVELOPMENTAL COURSE

Studying play often entails coding it into categories that typically vary according to one's theoretical perspective, as with the ethological and Piagetian categories mentioned earlier. In another widely used scheme emphasizing play's cognitive underpinnings, Smilansky (1968) focused on the categories of *functional* play (roughly corresponding to sensorimotor play), *constructive* play (building or art), *dramatic* (symbolic) play, and *games with rules*. Parten (1932), who was interested in social development, developed a popular coding scheme in which play is *solitary independent*, *onlooker* (observing others), *parallel* (playing near other children and often with the same types of objects, but not directly interacting with others), *associative* (involving some interaction and similar activity), or *cooperative* (organized group play). These latter two schemes are often combined in coding naturalistic playground play (Rubin et al., 1983). Burghardt (2011) mentioned many other ways in which people have categorized play, for example: large-motor, small-motor, mastery, rule-based, construction, make-believe, symbolic, language, sensory, rough and tumble, risk-taking, and arts play. I next discuss some of the more commonly used categories in studies of children's play.

Sensorimotor and Object Play

Sensorimotor play was first described in detail by Piaget, and Uzgiris (1967) who developed a coding scheme for it. In the Uzgiris Scale of Infant Development, mouthing is predominant at 2 months, and visual examination at 3 months. At 4 months infants begin hitting objects on surfaces, and at 5 months they begin shaking objects. Manual and visual examination of objects begins at 6 months; sliding, tearing and pulling objects commences at 7 months; and dropping and throwing objects at 8 to 9 months. All these forms of sensorimotor action of course can continue to be expressed later in the lifespan; for example, 7-month-olds still mouth objects (Ruff, 1984).

As this scale (and Piaget's substages) suggests, sensorimotor play initially does not involve objects, but by around 4 months of age it often involves one object (a rattle, for example), and in the second year it often involves two or more objects (Rosenblatt, 1977). The uses of objects can be functional and appropriate, as in putting a telephone to one's ear, or indiscriminant or stereotypic, as in banging a block on a table. The former sorts of uses increase notably in the second year. Although sensorimotor play continues throughout life, studies of sensorimotor play typically concern infants. Further discussion of object play (including its relation to other forms of play discussed here) can be found in Pellegrini (2013).

Physical or Locomotor Play

Another common category of play is physical or locomotor play (Pellegrini, 2011; Pellegrini & Smith, 1998), characterized by gross motor movement and by one's metabolic rate exceeding the rate it has when one is at rest. Such play can be solitary (hops, bounces, or rotational movements) or social; when social it often involves chasing (Power, 2000). Most theorists do not include sports games with physical play because sports have *a priori* rules; physical and locomotor play is by comparison spontaneous and unregulated.

Physical play has been divided into two subcategories (Pellegrini, 2011). The first is rhythmic stereotypies that occur primarily in the first year, peaking at about 6 months of age: rapid and repeated movements of limbs, head, and torso. Thelen (1981) saw such movements as transitional between uncoordinated and coordinated motor activity, because often they peak immediately prior to the emergence of coordinated activity. For example, rhythmic hand and arm movements appear just before complex

manual activity, and rocking on all fours occurs just before the onset of crawling. Such behaviors typically occur in response to specific eliciting conditions, like the appearance of the caregiver.

The second type of physical play is exercise play, which starts around 1 year and peaks around 4 to 5 years of age (Pellegrini, 2011). This includes behaviors such as swinging, hopping, running, and climbing. It occupies roughly 10%–20% of children's social play time, and is more common in boys than girls. This gender difference has been ascribed both to prenatal androgen exposure (Hines, 2011) and socialization. Fathers tend to engage in more physical play than mothers, and this is particularly true when they play with their sons (Carson, 1993).

Rough-and-Tumble Play

A prominent type of social play in animals, "rough and tumble" play (Harlow, 1962), describes play fighting interactions; such interactions can also be common in children. Play fighting typically involves the full body, for example, two children or animals tumbling on top of each other with the aim of holding the controlling position. In humans, play fighting is characterized by smiles and laughter, exaggerated movements, and reciprocal role-taking (e.g., varying who has the dominant position). In addition, when partners are of unequal strength, the stronger player in a play fight often engages in self-handicapping—something one would never expect to see in a real fight (Pellegrini, 2006). Although boys (and males of most species) engage in more physical rough-and-tumble play than girls (Blurton Jones, 1967), it is common to both genders (Power, 2000).

Play fighting has an inverted U-shaped prevalence function and peaks in middle childhood: Observational studies show it occupies about 4% of playground time in preschool and junior high school, and about 10% of time in elementary school (Pellegrini & Smith, 1998). During its peak ontogenetic period, play fighting appears to strengthen affiliation, in that play bouts are typically followed by other social activities among the players. In adolescence, play fighting appears to establish dominance in newly formed groups, after which it becomes infrequent (Pellegrini, 2006).

Studies in animals also reveal important functions of play fighting. Researchers studying animal behavior note that play fighting is likely to have important benefits (delayed and immediate), since it expends energy. In evolutionary terms, energy is expensive and presumably reserved for activities that promote survival and the production of offspring (Pellis & Pellis, 2009; Pellis, Pellis, & Bell, 2010) However, Pellis et al. note that play fighting cannot be essential, since play varies in frequency. Specifically, during times of stress, most animals engage in much less play fighting than they engage in when not stressed. However, even if it is not essential, they argue that play fighting likely provides small and subtle benefits to the organism, and is thus enhancing development.

Several social deficits have been observed in rats that are deprived of play. For example, when other rats sniff them, they become aggressive in response; indeed all their social encounters are more likely to become aggressive (Einon & Potegal, 1991; Potegal & Einon, 1989). Compared to other rats, play-deprived rats are more easily stressed after being the target of more dominant rats' aggression, which they more frequently are (Von Frijtag, Schot, van den Bos, & Spruijt, 2002). Rats deprived of play during the juvenile period also show diminished social coordination. This is revealed in their inability to effectively mate, a behavior that requires two animals' bodily coordination.

However, to deprive rats of rough and tumble play typically also means to deprive them of peer contact, resulting in a confound. An important issue is whether the behavioral differences seen in such rats stem from the isolation, rather than the lack of rough and tumble play. To investigate this, Einon et al. housed juvenile rats with a single adult female (Einon, Morgan, & Kibbler, 1978). This allowed the rats to engage in all normal social behaviors—huddling, grooming, and so on—except play fighting, because adult female rats rarely play fight, and when they do, it is not with young rats (Pellis & Pellis, 2009). The researchers found that the same social abnormalities arose when young rats were prevented just from playing in the juvenile period. In fact, these abnormalities arose only when rats were prevented from playing during a particular critical period, 25 to 45 days after birth. Social isolation earlier and later had no such effects (Einon & Morgan, 1977). Neural homologues have been found in animal studies for these behavioral changes; peak periods of play are associated with peak periods of organizational change in areas of the brain that subserve both play fighting and social behaviors (Pellis & Pellis, 2009).

Exploratory Play

Exploratory play refers to investigative play with objects, characterized by curiosity about what is novel and not well-understood. In its initial appearance, exploratory play overlaps with sensorimotor play with objects (Bornstein,

2006). This raises an important issue: exploratory play is a controversial category in that it is contradictory. By definition, play is often considered as a privileging of means over ends, and yet when children explore an object they are sometimes doing so with an end in mind. For example, if they have seen another child create a noise with a toy, they might handle the toy with a goal of producing that noise. On this point, a difference between exploration and play has been referred to as being between an orientation of "What does this object do?" (a closed-ended approach) and "What can I do with this object?" (an open-ended approach) (Hutt et al., 1989). In Berlyne's (1960) typology, when one's purpose is to bring about a particular result, one is engaged in "investigative exploration" (p. 136), not play.

Exploration and play also differ in their antecedent conditions. Exploration occurs when one is confronted with novelty, whereas play follows familiarity. Thus when children first encounter an object, they explore it, and once it becomes familiar, they play with it. The two activities also have different biological markers: Heart rate variability (HRV) is high in play, suppressed in exploration, and even more suppressed in problem-solving (M. Hughes & Hutt, 1979). At issue is where one draws the line between exploration and exploratory play.

A recent area of active research concerns children's experimentation with objects in order to achieve particular results (Schulz & Bonawitz, 2007). The aim of this research is seeing whether children engage in systematic testing (Gopnik et al., 2004), revealing Bayesian reasoning (Gopnik & Wellman 2013). Children's activities as they test out the objects are described as exploratory play (Walker & Gopnik, 2013), but at issue is whether one should view such activity merely as exploration, given that the child has a goal in mind. It is interesting to note that Burghardt's (2011) first criterion for play ("The behavior is incomplete, exaggerated, awkward, precocious, occurs in a modified sequence, or is aimed at an unusual target to the activity.") is not satisfied by such exploration. For example, in exploring a music box in order to have it make music, children are aimed at a particular target, and their movements are not exaggerated, awkward, and so on. In sum, then, when there is an end state in mind that the actor is trying to achieve, an activity might be better described as exploration than as exploratory play.

Construction Play

Construction play involves building things with materials, such as LEGOs or clay, thus it sometimes overlaps with art or object play. It is a common activity in preschool classrooms, occupying 40%–50% of children's time in some observational studies (Rubin, Maioni, & Hornung, 1976; Rubin, Watson, & Jambor, 1978), although its prevalence when children were observed at home was much less—0%–5% among children Ages 0 to 6 (Bloch, 1987). Pellegrini and Gustafson (2005) found that about 15% of preschool free-play activity is construction play, and noted that Rubin's definition of construction play was quite broad. Although Smilansky (1968) fit construction play into her scale midway between sensorimotor and symbolic play, Rubin et al. (1983) argued that its predominance in early childhood (concurrent with symbolic play) renders it a poor fit for that scale. Piaget (1962) saw construction play as involving too much accommodation to be considered play at all: He noted that in construction "play" children were aiming to build something in particular.

A particular type of construction play, building tools, has been examined especially in studies of problem solving. In some earlier research, preschoolers saw an adult put two sticks together with a clamp to construct one long stick (Sylva, 1977; Sylva, Bruner, & Genova, 1976). After the initial demonstration, some children were allowed to play with the sticks for several minutes, whereas others watched further demonstrations. Then all children were given a lure-retrieval problem, which required that they use a long stick to get an object. Although the actual results were not as strong (see Sylva, 1974) as is implied in later papers, and did not replicate with blind testers (P. K. Smith, Simon, & Emberton, 1985), there was some suggestion that perhaps the playing with the sticks had a positive effect on solving the problem. Other studies, however, have shown that children who engage in more construction play generally also are more likely to solve problems that involve construction (Gredlein & Bjorklund, 2005; Pellegrini & Gustafson, 2005). This could imply that the experience is beneficial, or that children who are motivated to construct are also by nature better at seeing how one could do so to solve problems.

Symbolic Play

The most commonly studied form of human play is symbolic play, in which one object or situation is made to stand in for another, in a spirit of fun and amusement. As noted earlier, Piaget saw symbolic play as a hallmark of representational thought in the preoperational stage, and it is the signature form of childhood play. Indeed,

when adults were asked to judge videotaped episodes as play or real, the criteria they said they relied on most heavily was a fantasy or pretend element (P. K. Smith & Vollstedt, 1985). Pretend play emerges around one year of age in middle-class American children, and peaks around 4 years, when one study found that most children engaged in pretend play for about 45 minutes during a 3- to 4-hour observation period (Haight & Miller, 1993). Although pretend play appears somewhat later in cultures in which it is not encouraged by parents (Lillard, 2011), in every culture in which it has been studied symbolic play emerges by the age of 3 and peaks a few years later (Power, 2000). Although symbolic play was described by both Piaget and Vygotsky as ceasing around the age of 6, a recent study found the average age for ceasing to engage in child-like pretend play was 11 years old, and many people claimed to still pretend as adults (E. D. Smith & Lillard, 2012).

Leslie (1987) noted three types of transformation that can be made in symbolic play. Object substitution occurs when a child uses one object for another, for example, straddles a stick as if it were a horse. Substitution of properties is when a child pretends that something has one or more different aspects than it actually has. For example, one might act as if an empty cup is full, or a dry animal is wet. Imaginary object play is when a child pretends something is there when it is not, for example, pretends to talk on the phone when not holding an actual receiver. The issues of what objects children use in their object substitutions, and how well they understand others' pretending when different types of objects are used as substitutes, have been actively researched in recent years (see section titled Contemporary Issues in Play Research).

A special type of imaginary object play (overlapping with social play) is imaginary companion play, in which children establish ongoing relationships with imagined others, sometimes embodied in stuffed animals or dolls (Taylor, 1999). Roughly half of all children have imaginary companions at some point in their lives, and although early reports suggested this was indicative of psychopathology, most evidence shows that children with imaginary companions are for the most part no different from other children. There are some exceptions, for example, they have advanced social cognition (Gleason, 2013; Prentice, Manosevitz, & Hubbs, 1978; Taylor, Carlson, Maring, Gerow, & Charley, 2004), better referential communication skills (Roby & Kidd, 2008), and higher levels of narrative ability (Trionfi & Reese, 2009). At-risk adolescents with imaginary companions also fare better than those without them (Taylor, Hulette, & Dishion, 2010).

Summary

Play has been categorized in many different ways, and the categories overlap. Several forms of play show an inverted U function, peaking at some point in childhood, but they all continue throughout life. Five categories of play have received particular attention in the research literature. Sensorimotor play has a prescribed course of development beginning in infancy, and often involves objects. Physical or locomotor play has two main forms, rhythmic stereotypy which peaks around 6 months, and exercise play which begins around one year. One form of physical play is rough and tumble play, which peaks in middle childhood and is especially pronounced in boys. At least in animals, rough and tumble play confers many developmental benefits, and is required for normal social and sexual function. Exploratory play is open-ended play with objects, in contrast to exploration, which typically is done with a goal in mind. Construction play occurs when a child builds or makes something. Piaget actually did not consider this true play, because the child often has in mind an end state towards which their activity is geared. Studies of play and problem solving have often involved constructing a tool to solve a problem. Symbolic play is the signature form of play in early childhood, and it continues into middle childhood and beyond.

CONTEMPORARY ISSUES IN PLAY RESEARCH

In this section I discuss six topical issues in research on play. Because pretend play dominates this literature, all six issues concern pretending. Briefly, the issues are the relation between pretend play and early social cognition or "Theory of Mind" (see Carpendale & Lewis, Chapter 10, this *Handbook,* this volume), the relation between pretend play and symbolic understanding more generally (see Callaghan and Corbit, Chapter 7, this *Handbook,* this volume), how children discriminate pretend from real, object substitution in pretense, how children are initiated into pretend play, and whether pretend play improves developmental outcomes.

Pretend Play and Theory of Mind

One very active area of research on play in the past 30 years has been its association with theory of mind, the conceptual structure underlying social cognition. Theoretical reasons for this link led to many studies of the relation;

these studies have concerned mental representation as well as other component mental understandings, like pretend intentions.

Mental Representation

In the 1980s, as theory of mind research began to surge, many researchers took a renewed interest in play because of a striking similarity between the apparent conceptual requirements for passing a false belief task and engaging in pretend play. In the false belief task (Wimmer & Perner, 1983), children learn that someone has a certain belief, for example, that chocolate is in a cupboard. But then that belief is made false: Someone else moves the chocolate to a different location without the first person's knowledge. Children are asked to report on this false belief. In order to do this, children must be able to represent a representation of the world (the first person's belief about where the chocolate is) even though it differs from their own representation—what they know to be true of the world. Children tend not to pass this specific task until around four to five years of age. (For further discussion, see Carpendale & Lewis, Chapter 10, this *Handbook,* this volume.)

Structurally, what children are being asked to do in the false belief task seems quite similar to what they already and frequently do when they watch someone pretend (Flavell, 1988; Forguson & Gopnik, 1988; Leslie, 1987). To correctly interpret their mother pretending a pen is an airplane, they have to represent their mother's representation ("the pen is an airplane") even though it differs from reality ("the pen is a pen"). From the 1980s until recently, many theorists and researchers grappled with this conundrum. Because of their early proficiency in pretend play, people assumed children must understand mental representation by the age of 2, so it was not clear why they failed false belief tasks at 3 and 4 years old.

One possible explanation put forth for why children can attribute pretense a full 2 years earlier than they can attribute false belief was "direction of fit" (Gopnik & Slaughter, 1991; Searle, 1983). Beliefs have a "world to mind" direction of fit: The state of the world (via perceptions) leads to changes in beliefs. In contrast, other mental states that children understand earlier, like desires, have a mind to world direction of fit: The state of one's mind (one's desires) leads (via one's actions) to changes in the world. Children understand desires earlier than they understand beliefs, and one possible reason is that the mind to world direction of fit is easier. Pretending also has more of a mind to world direction of fit. What one pretends (meaning mentally represents as one's pretense) leads to changes in the world because people often act out their pretend representations. Although one can see how this direction of fit difference could explain pretend understanding arriving earlier, a preliminary issue is actually whether understanding pretense representations does in fact come in earlier than understanding false belief.

Flavell (1988) remarked that children might conceive of pretending as something we *do,* more so than as something we *think*. Perhaps young children do not conceptualize pretending as involving mental representations A study we did later was in effect a test of this possibility, comparing children's understanding of three mental states (pretend, want, and think) with and without action (Lillard & Flavell, 1992). We used a very simple version of the false belief test, simply telling children, of a doll in a dollhouse, "He thinks there is juice in this cupboard. Actually there is milk, but he thinks there is juice. What does he think?" Three-year-olds got even this very pared-down version of a false belief task wrong, typically changing the doll's belief to match what we had told them was reality: "He thinks there is milk." Children made this same mistake for pretend as well: In response to, "He's pretending there is juice in this cupboard. Actually there is milk, but he's pretending there is juice. What is he pretending?" they told us he was pretending there was milk. However, half the time, we had the protagonist carry out an action that fit the mental state. In this case, "He's getting a cup" preceded the entire statement, and we put a cup in the doll's hand. Although action did nothing for belief or desire, it significantly boosted performance for pretending. This finding seemed to support the possibility that for young children, pretending is just an action, a stance also suggested by Perner (1991). Perhaps when young children pretend themselves, or see others pretending, they are not aware of the degree to which mental processes are involved in those actions.

To test this possibility, I presented young children Moe, described as a troll from the Land of the Trolls, who knew nothing about kangaroos—had never seen or heard of a kangaroo, and did not even know that they hopped (Lillard, 1993b). However, he was hopping, and he happened to be hopping just like a kangaroo hops. Four- and 5-year-olds were asked to respond to control questions showing they understood the premises, and then were asked the crucial question, "Was Moe pretending to be a kangaroo?" Lacking all knowledge of kangaroos, Moe clearly could not be pretending to be one. However, if one conceived of pretending only as an action, then, because Moe was hopping *like a kangaroo*, children should say yes, he was pretending to be one. In this and many subsequent studies, most 4- and even

5-year-olds reported that the ignorant Moe was pretending to be a kangaroo (or whatever he appeared to be like), on all four of four trials (see references in Lillard, 2001a). The Moe test has good retest reliability ($r = .88$) over 3 weeks (Lillard, 2001b). Improvement is gradual, with the percentage of children passing increasing about 15% each year from the ages of 4 to 8 (Richert & Lillard, 2002).

Many people were surprised by this result and procedural variations were explored (see review in Lillard, 2001a). Under certain conditions children do better on Moe-like tasks. For example, children do better when the pretenders are the children themselves than when they are other people (or dolls). Children also do better when the pretense content is not itself real, for example pretending to be the Lion King, possibly because such characters violate real-world causal rules and therefore are themselves imaginary (Sobel & Lillard, 2001). The issue of how thoughts in or about fantasy contexts relate to real world thinking is a thriving topic of research (Lillard & Woolley, 2014; Skolnick & Bloom, 2006; Taylor, 2013; Woolley & Ghossainy, 2013).

To some degree, children's poor performance on the Moe test stems from a lack of understanding of how knowledge relates to representations, because it extends to other types of representations like drawings (German & Leslie, 2001; Richert & Lillard, 2002). In addition, when "enabling conditions" are made concrete, for example by inserting a battery in Moe that is purported to convey knowledge of kangaroos, performance improves substantially (Sobel, 2009). If children are given an alternative possible pretense without negative associations, and the acting-like choice is negatively associated with Moe, performance improves. For example, when rabbits are not previously mentioned but Moe is said to know nothing about kangaroos, then the forced choice question, "Is Moe pretending to be a rabbit or a kangaroo?" yields better performance. Performance also improves if a negative option is given ("Is Moe pretending to be a kangaroo or is he NOT pretending to be a kangaroo?"). Children also do better when shown thought bubbles depicting the pretense idea, suggesting that when a positive thought is supplied ("This is what he is thinking about") and there is no negative association with the thought content, children can connect thought content and pretense (see Lillard, 2001a, review). Some maintain that these methodological variations show children *do* understand that mental representation undergirds pretending. However, in real life, children are not routinely assisted by thought bubbles when they watch others pretend, and success on many of these other variations can be explained as reflecting associations. The fact that children do better under some conditions might be best interpreted as suggesting nascent or emerging knowledge.

Leslie and Friedman do not believe that the Moe evidence just presented shows pretending is mainly an action for children (Friedman & Leslie, 2007). They note that concepts can sometimes emerge from mechanisms, rather than only from knowledge (German & Leslie, 2001). Color, for example, at one level rests on mechanistic eye receptors as opposed to knowledge about colors. To Leslie, "representation" can exist in this same way, resting on an innately specified mind-reader he calls a Theory of Mind Mechanism (ToMM). Given certain behaviors, ToMM automatically computes mental states. When a mother talks into a banana, a child's ToMM automatically computes the pretend representation, "Mother pretends [of the banana] 'it is a telephone'" (Leslie, 1987). "The ability to recognize pretence in other people and to infer the content of their pretence may not require an understanding of the relation between ignorance and pretence" (German & Leslie, 2001, p. 64).

To test this idea, Friedman, Neary, Burnstein, and Leslie (2010) placed a cup in front of a stuffed bear and a second cup in front of the experimenter, then gave the child LEGO blocks. Using either a very low-pitched voice or an ordinary voice, the experimenter asked, "Can you put a block in my cup?" Assuming (as one likely should) that children know that stuffed bears do not really talk, if children put the block in the bear's cup when the low voice is used, they must actually interpret the low voice as the experimenter pretending to be the bear. Even 2-year-olds did very well on this task, choosing the bear's cup when the voice was low. Friedman and Leslie considered this a test of a representational understanding of pretense. However, their result would be obtained if children only knew that the low voice corresponded to the bear, and by extension that "my cup" in a low voice referred to the bear's cup. The experimenter created an "as-if" situation of the bear talking. It is not clear from this study that children process mental representations as such (versus merely processing behaviors like talking in a low voice) when they observe pretense.

Another challenge to the Moe task was posed earlier by German and Leslie (2001). Leslie does not view mentalistic understanding as emerging in a theoretical structure, but rather sees mental representation as innately specified. Because of this, the idea that children might not understand that pretending relies on knowledge or mental representation is not troubling to him. Leslie maintains that "believe" is also innately specified, and he and German showed that

children show a similar difficulty with the knowledge constraints on belief as the Moe task reveals with pretend (and much as Richert and Lillard [2002] showed with drawing). They presented 4- and 6-year-olds with a bag that hopped up and down because there was a rabbit inside. A character who knew nothing of the existence of rabbits observed the bag, and children were asked if the character knew there was a rabbit inside. Children said yes, he did know it was a rabbit, despite ignorance of rabbits. This is analogous to the Moe task. Based on a similar sequence of events, we concluded that children do not have a mentalistic concept of pretending. However, by these ages children are believed to have a mentalistic concept of belief (Wellman & Estes, 1986). Thus, it could be simply that children have not yet grasped the relation between pretense and knowledge, and have not embedded pretending in a theoretical framework. This point, argued very cogently by Friedman (2013), is a good one. However, convergent evidence using different approaches to discerning children's concept of pretense could be taken to support that children interpret pretending mainly as a behavior.

Some convergent evidence came from a study of whether children think that pretending requires a brain. Others have shown that young children know brains are used for cognitive acts, but they do not know one needs a brain for physical acts (C. N. Johnson & Wellman, 1982). Across five experiments, young children consistently claimed that one just needs a mind or brain for conative operations like thinking, and that one just needs a body for physical acts like brushing one's teeth, but not until 6 to 8 years of age did children categorize pretending with the conative acts (Lillard, 1996). This supports the idea that for young children, pretending is more an action than a cognitive mental state.

Other Mentalistic Aspects of Pretense

Further studies suggesting pretense is regarded as primarily behavior rather than mental state for most young children systematically tested children's understanding of several different components of the pretense concept. Pretend play has been suggested to have five necessary features: (1) an animate being who does the pretending, (2) a reality, (3) a pretense representation that contrasts with that reality, (4) the intentional projection of that representation on to reality, and (5) awareness that one is doing so. There is also a sixth characteristic feature: action (Lillard, 1993a).

Sobel (2004) examined whether children understand that *awareness* of what one is pretending (feature #5) is necessary for pretending to take place. In one study, for example, a child was described as looking like a wiggling worm when he sleeps. Because he is asleep, one of course would not claim he was engaging in pretend, but 3- and 4-year-olds failed to appreciate this fact, and stated that the child was pretending to be a worm.

To test whether children understand that pretending has an animacy constraint (feature #1), such that only animate creatures can engage in pretending, we showed preschoolers various entities from three categories (people, vehicles, and furniture), and asked if each entity could pretend, think, breathe like we do, move because of something inside it, and get wet (Lillard, Zeljo, Curenton, & Kaugars, 2000). The first two activities listed (pretending and thinking) require thought or sentience, the first three require animacy, the first four require some sort of "engine," and the fifth (getting wet) could happen to anything. Results suggested that young children do not appreciate that pretending is restricted to animates, but they do understand that thinking and breathing have this restriction.

In another study, the intentional component of pretend (feature #4) was probed, by explaining that although he was hopping like a kangaroo, Moe was not trying to be like a kangaroo, did not want to be like a kangaroo, and did not even like kangaroos. Four- to 6-year-old children still claimed he was pretending to be a kangaroo (Lillard, 1998).

Others, however, have shown that young children might have an implicit understanding of pretense intentions prior to the explicit ones previously tested. First, Joseph (1998) showed that when presented with two characters, one of whom had a bad cold and was sneezing and the other of whom was just pretending to sneeze, 3-year-olds correctly named the latter character as the one who was "trying to sneeze." Rakoczy showed that when asked to copy someone who was pretending to write versus someone who was unable to write because the pen was capped, 2-year-olds faithfully copied the pretend action but fixed the problem (removed the pen cap) for the person who was unable to write (Rakoczy & Tomasello, 2006). These studies suggest some understanding of the intentional aspects of pretending can be tapped through less explicit procedures.

Another study has looked at the ability of even younger children—15-month-olds—to interpret pretend action sequences in terms of the actors' intentions (Onishi, Baillargeon, & Leslie, 2007). Children saw an actor, a pitcher, and two upside-down cups (one red and one blue) on a stage. The actor turned the cups right side up, pretend-poured in one, then either pretend-drank from the cup she had poured into, or pretend-drank from the other cup. The children looked 12 seconds longer, on average,

when she drank from the cup she had not previously touched. However, it was possible that children looked longer when the new cup was used because acting on that cup was more novel. This was tested in a follow-up study in which shoes and tubes were used instead of cups. When children were familiarized on a preliminary trial with pretend drinking from shoes and tubes, the prior result was replicated: Children looked longer when the actor drank from the new shoe or tube than when the actor acted on the shoe or tube the actor had just poured into. It is not clear, though, why the interpretation of this difference in the first study did not apply here also: Children interpret an action sequence (pour then drink) as typically involving the same object, and it seems strange when two different objects are used. Clearly children are tracking behaviors and objects in this study, but it is not clear that children are interpreting pretense intentions.

In sum, an explicit understanding of pretend intentions does not emerge until around 8 years of age. However, there are indications that by the age of 2, children might be starting to have an implicit understanding of pretense intentions. Whether this understanding extends to children as young as 15 months old requires further research.

Explaining Pretense-Theory of Mind Correlations

Studies discussed so far suggest that children do not have a precocious appreciation of pretend mental representations. However, pretend play is associated with having a more advanced theory of mind (Astington & Jenkins, 1995; Taylor & Carlson, 1997; Youngblade & Dunn, 1995). If this correlation is not due to children knowing about the mental states that create pretense, to what is it due? (For a thorough discussion, see Lillard et al., 2013). One possibility, hinted at by the success children show on more implicit pretend-intention tasks, is that children implicitly understand pretend mental representations, but that this understanding is not yet available to consciousness. Such representations are hypothesized to be "redescribed" in the course of development, and to eventually become accessible for reflective abstraction (Karmiloff-Smith, 1992). Recently similar ideas have been proposed to account for infant false belief findings (Apperly & Butterfill, 2009). Such implicit understandings could underpin the associations between theory of mind and pretending.

A second possible reason for the associations found between theory of mind and pretend is aligned with one of the main theoretical views on how people understand others' minds: simulation. This is the idea that to understand others, people simulate others' circumstances and thereby experience others' attending mental states, which people then project on to those others (Goldman, 1993). Simulation theory has been buoyed by the discovery in monkeys of "mirror neurons," which fire both when performing actions and when watching others perform those same actions (Gallese & Goldman, 1998). Such neurons are hypothesized to also exist in humans and to provide a physical analog for simulation.

Because some studies show a relation only between theory of mind and pretend role play, not other forms of pretend play, simulation could be a stronger candidate reason for the theory of mind-pretend link than representational redescription. Other evidence for simulation comes from studies showing earlier theory of mind among children with imaginary companions (Lillard & Kavanaugh, 2014; Taylor et al., 2004). When children have an imaginary companion, it seems likely that they are representing the companion's mental states, hence this is also considered a form of role play. However, the results showing an association between role play and theory of mind are actually inconsistent (Lillard et al., 2013). For example, one study showed a positive relation between social pretend play and affective but not cognitive perspective-taking (Connolly, Doyle, & Reznik, 1988), whereas another very similar study showed a negative relation between social pretend play and affective perspective-taking (Cole & LaVoie, 1985). Regardless, correlation is not causation, and it is possible that children who create imaginary companions or engage in a lot of social pretend play already have an advanced understanding of mind, or other ingredients that will promote a more advanced understanding. Even consistent correlations would not be evidence that role play causes theory of mind.

Training studies can reveal causal relations. However, the literature examining the influence of training children in role play on their subsequent theory of mind is fraught with problems. In some training studies, control groups have not had similar experiences. For example, Dockett (1998) had one group of children visit a pizza restaurant, placed a pizza restaurant play area in their classroom, and had their teachers engage in and document pretend pizza play for several weeks. Over those weeks, an experimenter intervened with children's play to encourage increasingly complex play. Meanwhile, the control group had "business as usual" school experiences. Although the children in the play group improved significantly more on theory of mind over the three weeks of the study than children in the control group, it is not clear whether the improvement was due to the play or the increased adult interaction or to

some other aspect of their different experiences during the training.

Differential adult contact has often been a concern in pretend play training studies, and P. K. Smith, Dalgleish, and Herzmark specifically sought to address this concern by carefully equating adult contact in the pretend and control conditions. When this was done, both groups improved on a range of tested outcomes (P. K. Smith et al. 1981), strengthening the concern that adult contact might be responsible for the effects found in Dockett's training study.

There are some suggestions that taking drama classes might improve theory of mind or at least social skills. Goldstein and Winner (2010, 2012) tested children who were enrolled in drama or other types of classes. Unfortunately, self-selection is a potential problem with this study: Children who choose (or whose parents choose) drama classes might already be better in theory of mind, or more prone to more rapidly improve in theory of mind, regardless of taking those classes. A different study took care of this selection problem by randomly assigning children to drama or music classes (Schellenberg, 2004). They found that year-long music classes were associated with greater IQ gains, and drama classes were associated with greater improvements in social skills as measured by parent report. Further research is needed to see whether the social improvement was due to the pretend play itself, or perhaps increased social contact that might occur in drama as opposed to music lessons. Regardless, this random assignment study provides better evidence that social skills might be influenced by drama classes, which involve role-taking processes that seem similar to those involved in social pretend play.

Lillard (2001a) proposed a complex model for the relation between pretend play and theory of mind, termed the "Twin Earth" model. Twin Earth is a hypothetical construct posed in some philosophical problems to allow for reasoning about philosophical problems on real earth. Twin Earth is exactly like real earth, except a few key variables are changed. I argued that just as philosophers use Twin Earth to facilitate their reasoning, children can use pretend worlds to try out different realities without real world implications. Although many aspects of their pretend worlds are the same as in the real world, a few key variables can be changed, and the child can then reason about the resulting new relations (p. 516). To the extent that the relations involve theory of mind constructs, this aspect of pretend play could assist theory of mind. Recently Gopnik et al. have highlighted that this decoupling of pretend play from the real world makes it a prime laboratory for reasoning about causal relation of all kinds (Buchsbaum, Bridgers, Weisberg, & Gopnik, 2012; Gopnik, 2011), not just theory of mind.

A child's entry into the Twin Earth of pretend play is helped by other factors that could also independently assist theory of mind. For one, early pretending with parents and siblings could heighten a child's attention to social signals (see later section titled "Initializing Pretend Play"), which supports theory of mind. It also could help develop symbolic understanding more generally, facilitating theory of mind. The Twin Earth model also notes that social pretend play can give children first-hand experience with the fact that they can only pretend what they know, in that sometimes other players might try to assign children roles that they know nothing about. One aspect of a theory of mind, knowing that pretense requires mental representation, is thus expected to be facilitated by pretense experience. This aspect of the Twin Earth model of pretend play has not been tested.

Summary

In sum, although in many studies social pretend play and theory of mind are related, neither the strength nor the reason for this relation is clear. Initially it was thought that the relation was causal: Because pretending involves *having* mental representations that differ from reality, it must also involve *understanding* that one has representations that differ from reality. Years of research have not borne this possibility out. A second possible reason for the relation is simulation: When a child pretends to be someone else, the child experiences (simulates) others' mental states, and this could lead to better theory of mind. The best evidence for this view would come from training children to engage in pretend role play, and then examining whether they showed greater improvement in theory of mind than did children trained in some other way. Some studies have attempted to do this, but failed to sufficiently control the comparison group experience to make sure it was play and not some other feature (like increased adult contact) that led to the improvement; when other features have been more tightly controlled, no significant findings have been obtained (Lillard et al., 2013). Another possibility is that the relation is due to implicit understanding of mind being involved in pretend play, and that representational redescription is needed to make that understanding explicit. Alternatively, perhaps the reason social pretend play and theory of mind are associated is because children with a more advanced theory of mind are better able to engage their peers (or imaginary companions) in pretend play.

Symbolic Understanding

Another active research area concerns the symbolic underpinnings of pretend play. Three topics have been addressed in this domain: (1) how the early symbolic understanding evidenced in pretense is manifested in other domain; (2) the social context in which pretend symbols arise; and (3) young children's pretense comprehension, specifically their ability to follow pretend sequences involving symbols.

Symbols Across Domains

People have long appreciated that pretend play is symbolic. Piaget (1962), Werner and Kaplan (1963), and others pointed out this isomorphism in theory; empirical research supports it by showing that pretend play and language development proceed in parallel (McCune, 1995; Tamis-LeMonda et al., 1992). Important advances in children's understanding of symbols have stemmed from studies using DeLoache's (1987) model room task, in which children watch as a little Snoopy is hidden in a small model of a big room. Then the child is brought to the big room, and told that big Snoopy is hiding in the same place in the big room as little Snoopy was hiding in the little room. Children's performance on this task improves dramatically from 2.5 to 3 years of age, which is believed to reflect emerging knowledge that one object can be a symbol for another. This same understanding is thought to be inherent in false belief tasks (when a child has to see a person's belief as symbolic of how things are or might be in the world) and pretend play (when a child has to see a substitute object, like a banana, as a symbol for a real object, like a telephone; see Perner, 1991). Symbolic understanding is also key to language, because words stand for referents.

A recent study examined how performance on the model room task and a similar task (picture-model) relates to language, theory of mind, and pretend play at four time points from 2 to 5 years of age (Lillard & Kavanaugh, 2014). Pretend play and language were tightly intertwined and strongly related to the picture and model room tasks (which were themselves highly interrelated). All these variables predicted performance on two batteries of theory of mind tasks at Ages 4 and 5. (Earlier theory of mind was not measured.) This supports the idea that pretend play has symbolic underpinnings, as well as that those underpinnings could be responsible for some basic theory of mind-pretend play relations observed in other studies. This is also interesting support for the Twin Earth model of pretend play, in which symbolic understanding undergirds theory of mind and partly explains theory of mind's relation to pretend play (Lillard, 2001a).

The Social Construction of Symbols

A second advance concerning symbols and pretend play involves the social nature of symbol construction. Piaget has been criticized for treating children as stand-alone entities whose development arises from their own activity (see Smolucha & Smolucha, 1981; cf. Piaget, 1995), and Piaget (1962) discussed at length why ludic symbols in pretend were *not* "a product of social intercourse" (p. 99). This view of pretense as asocial was widely held until recently (see Rubin et al., 1983). Piaget's strong influence on the field might explain why many early studies of pretend play did not observe others interacting with children, preventing the possibility of studying the social construction of symbols in play (Göncü & Gaskins, 2007). As Vygotskian theory has become more prominent, more theorists have attended to the social context in which pretend play emerges (Göncü & Gaskins, 2007; Haight & Miller, 1993; Lillard, 2001a; Smolucha & Smolucha, 1998; Tomasello, 2008).

A prime example of this change is Haight and Miller's (1993) observational study in which 9 children were filmed in their homes (hence family contexts) for a total of 10–15 hours between 12 and 48 months. Virtually all of these children's early pretend play was initiated by their mothers. Over the three years of filming, gradually maternal participation waned, and sibling, peer, and solitary play became more prominent. The appearance of social pretend play before solitary pretend play is opposite to Piaget's sequence, but many studies support it for middle-class American families. However, in many other cultures pretend play is not engaged in by parents (Gaskins, 2013; Gaskins & Göncü, 1992; Lancy, 2007); in some it is even discouraged by them (Carlson, Taylor, & Levin, 1998); and parents in many cultures report far less pretend play by their children than American parents report (D. L. Singer et al., 2009). Perhaps lack of parent involvement in pretend play was the norm in Switzerland when Piaget did his observations, just as Fein claimed it was the American norm in 1981. Yet today U.S. middle-class parents often get pretending off the ground by jointly constructing symbols with their children.

Symbolic Sequences Involving Causal Transformation

A third concern is how well young children understand pretend play sequences involving substitute objects. Earlier research on this issue emphasized production: What children can produce in pretend play. A classic study of

this (Fein, 1975) examined how many object substitutions (in a sequence) young children can produce in a single pretend episode. Almost all the 24-month-olds could pretend to feed a toy horse when no object substitutions were involved, but only 70% could do so if one object was substituted, and only 33% could if both objects (the toy horse and the food bucket) were substituted.

Since the early 1980s, an emphasis on pretend *comprehension* has emerged, a change that is in keeping with the emphasis on pretending's social origins. Whereas in language, comprehension precedes production, it is not clear that this is the case in pretending (Hopkins, Smith, & Lillard, 2013). Despite the fact that parents get pretending off the ground in middle-class America, in general, in pretense, production precedes comprehension of others' pretend acts.

Leslie (1987) highlighted the importance of the comprehension of pretend symbols, and Harris and Kavanaugh (1993) performed the first major empirical investigation of it. In a series of experiments, a stuffed bear named Naughty Teddy carried out sequences of actions and children were asked to predict the consequences of those actions. For example, after Naughty Teddy poured pretend milk (out of an empty but real milk carton) on a pig, children were asked to describe the pig as wet or dry. In other studies, children were asked to pick which picture showed how the pig looked, or which of two model pigs was like it.

The authors concluded that by 28 months children understand adult references to make-believe substances and can correctly direct pretend actions to a prop that an adult has pretended to transform with those pretend substances. In this sense, 2-year-old children can share and understand symbolic objects whose existence the adult has stipulated. One caution regarding this research concerns the strength of the results. For example, Harris, Kavanaugh, and Dowson (1997) asked that children map from a pretend transformation to a picture or a real object. In one case, the experimenter poured "milk" from a milk carton onto a toy animal and asked, "How does the (target) look now?" (p. 5). Children needed to choose from a picture of the animal with no transformation, a relevant transformation (apparent milk spilled on the animal), and an irrelevant transformation (a red cross on the animal). On three such episodes, of sixteen 28-month-olds, none were correct on all three items, nine were correct on two, and seven were correct on one, averaging 1.56 correct. Although better than chance (one correct), one cannot say based on this that 28-month-olds have a solid appreciation of another person's pretend symbolic transformations. Younger children (21 months) were at chance, and 37-month-olds performed better, averaging 1.94 of 3 with the pictures. Although this line of research is often cited as showing that very young children *do* understand pretend symbols as proposed by others, one might also emphasize the flip side, noting that the understanding still is somewhat tenuous even at age 3 (see also Ma & Lillard, 2006, discussed later).

A criticism of this initial line of research was that children could often solve the pretend causal sequence problems by acting on the object that was previously acted on. Walker-Andrews and Harris (1993) addressed this by adding "complex" episodes in which two objects were transformed, a further action reversed the transformation of one of the objects, and children were asked to act. For example, two bowls were filled with pretend cereal, one bowl of cereal was eaten, and children were asked to "Give the doll some cereal"; in this case the correct choice is not the bowl on which the experimenter most recently acted. Although young 3-year-olds were quite proficient at these more complex episodes, young 2-year-olds were not. However, in a later study by Walker-Andrews and Kahana-Kalman (1999), 24-month-olds were 75% correct for episodes involving wet-dry and dirty-clean transformations, and only empty-full transformations posed greater difficulty. Perhaps children's differential sensitivity to these different types of transformations is because dry and clean are standard states to which most cultural objects are returned, whereas the standard state regarding empty and full is less clear.

Others have suggested these pretend comprehension tasks underestimate children's understanding, because children are asked to carry out or make judgments about actions that they cannot yet do well even in real scenarios (Bosco, Friedman, & Leslie, 2006). These researchers have used actions that are more familiar to children. When shown an experimenter drinking real water from a glass or pretending to drink, then asked to really drink themselves or pretend to drink themselves, 15- to 18-month-olds were correct on average on about 1.6 of 2 tasks with no difference between pretend and real. A problem with this design is that it is not clear whether children were pretending to drink (i.e., had the requisite mental states), or were just carrying out drinking actions when instructed to do so. Walker-Andrews and Harris (1993) warn of "modeling effects" when assessing pretense comprehension in this way.

The issue of how we know when very young children are pretending versus carrying out functional actions, or in this case simply following instructions, is unresolved. As stated earlier, Piaget (1962) relied on "knowing smiles" in

the presence of an audience, but it is not clear that this is an airtight criterion, and it is rarely mentioned in empirical reports. Bosco et al.'s point, however, is well-taken: If a child cannot carry out a behavior for real, we cannot expect a child to do it in pretense. Their deeper claim is that the research shows that as soon as children can understand something in the real realm, they can understand it in the pretend one (Leslie, 1987). Current research does not support this claim.

We still have much to learn about pretend symbols. Bates (1979) talked of two critical double-headed advances in children's communication through symbols: (1) the onset of communicative intentions or using conventionalized or ritualized symbols, and (2) the emergence of the use of *novel* symbols or the discovery that things have names. When children start to be able to use anything as anything else, they have reached the second advance. In pretend play, most anything is possible; most anything can stand for anything else. But contrary to Bates' (1979) implication that both developments occur simultaneously, the two skills actually emerge in two steps, at least in pretend play. Children first understand conventionalized symbols in pretend (object replicas) and then advance to using disparate objects as substitutes. This is the topic of the next section.

Object Substitution

Another area in which pretend play research has recently advanced is children's comprehension and production of object substitutions. Earlier research (for references see Rubin et al., 1983) showed that object substitutions in pretend production are rare prior to 19 months (when children do already pretend with actual objects, for example, use an empty cup to pretend to drink), and that by 24 months about 75% of children use substitute objects in pretense. Substitute objects with no set function (e.g., a block as opposed to a pen) can be substituted at earlier ages, as can objects whose form is more similar to that of the intended object. Imaginary (no object) substitutions are more difficult. For example, children will use a body part (a finger) as a toothbrush to mime brushing their teeth earlier than they will hold an imaginary toothbrush. As mentioned previously, in earlier studies, children's pretending was measured by their production of pretense acts, often after an adult modeled those acts; a major change in pretend research in recent years has been to examine comprehension of pretend acts.

In one large-scale exploration of this, Bigham and Bourchier-Sutton (2007) showed 3- to 8-year-olds a series of pretend acts (two to three each of seven types) and asked, "What am I pretending?" Five types of pretense systematically varied form (similar and dissimilar) and function (similar, ambiguous, or dissimilar), omitting the combination of similar function, dissimilar form. The other two types were imaginary and body-part substitutes. To illustrate, for trials with sawing actions, children might see a toy saw (similar form and function), wooden blocks (which could be either similar or dissimilar in form, and always were ambiguous with regard to function), a wooden spoon (similar to a saw in form, dissimilar in function), a straw (dissimilar in form and function), sawing as if one were holding an imaginary saw, or sawing with one's hand representing the saw.

Five- to 8-year-olds outperformed 3- to 4-year-olds on all types of substitute. At both age levels, similar form and function substitute object pretense was most often comprehended. Beyond this, for the younger children, all substitute types were equally difficult. For older children, however, dissimilarity in form or function presented particular difficulty, with the worst performance occurring when both features conflicted with the real form and function. Imaginary object pretense was easier to interpret than pretense involving these conflicting forms, and statistically no different than body-part-as-object pretense.

These results were interpreted as showing problems with triune representations (Tomasello, Striano, & Rochat, 1999). With dissimilar objects, children have to interpret a triune representation: (1) a manipulable object (a soft yellow thing); (2) the object as its actual identity and function (a banana for eating); and (3) the object as what it is being substituted for (a telephone). By contrast, when an object is ambiguous or similar, a child no longer has to consider the actual identity, either because it has none (ambiguous objects, like sticks, have no set function) or because it does not contrast with what it is being used as (similar objects).

Earlier studies had looked at pretend object substitution solely in terms of production, and found earlier ages of understanding than the Bigham and Bourchier-Smith study, which asked about pretense comprehension. Examining both in a single study, Hopkins, Smith, and Lillard (2013, April) randomly assigned preschoolers to production of one of two types of comprehension conditions: forced-choice and open-ended. Objects varied systematically in form and function from the target object for which they served as a pretend substitute. The results confirmed that for pretense, production precedes comprehension: Even the youngest children were near ceiling on production trials.

For comprehension, children did better with similar than dissimilar objects. A novel contribution of this study was to examine individual differences in cognitive processing that predict pretense substitute object comprehension. Interpreting another person's pretend act might require considering the person's mental state (what the pretender is thinking the object is), and also might require inhibition of the object's real identity. Both predictions were borne out. Children who scored higher on a Theory of Mind scale (Wellman & Liu, 2004), and children who scored highest on tests of inhibitory control were better able to interpret pretend substitute objects.

Further research should examine even younger children to see how function plays into their ability to *produce* different object substitutions; thus far studies that have tested younger children have only examined form. More recent research has reiterated the idea that form is crucial in early object substitutions: Toddlers' ability to recognize geometric form similarity predicted their object substitutions in pretend play (L. B. Smith & Jones, 2011).

Children's early reliance on shape similarity is interesting in light of the "symbolic" element of pretend play. The highest form of symbol is arbitrary (Deacon, 1997), and yet young children's forays into symbolism in most areas begin with symbols that closely resemble their referents; only with age and experience are the symbols of pretend play allowed to differ in these respects from their referents. One sees the same limitation with symbols for spatial locations, like maps (Liben & Downs, 1989), scale models (DeLoache, 2000), and pictures (Simcock & DeLoache, 2006). Initially, for example, children think the airplane on the map means a real airplane is on the ground there, or that a blue line designating a road represents a road that is really blue. Only in language are the symbols initially truly arbitrary with respect to their referents, and infants learn this symbol system with massive exposure. However, by 13 months, as few as nine exposures are needed for a child to learn a word (Woodward, Markman, & Fitzsimmons, 1994). The massive exposure paradigm should be adopted in research on pretending. It would be interesting to know at what age an arbitrary substitute object that has been labeled and demonstrated nine times is understood in the context of pretending.

In sum, in pretend play, unlike in language, pretense production with substitute objects appears to precede comprehension. What objects can be substituted at what ages has been probed in several studies, as an indicator of the flexibility of children's symbolic thought. Young children's production and comprehension of pretend object substitutions are both reduced as the form of the substitute becomes less similar. Dissimilar function also challenges pretend comprehension at older ages; the extent to which it challenges pretend production at younger ages is a topic ripe for further research.

Distinguishing Pretense From Reality

Whether children can keep pretend and real separate is an important and intriguing issue. Several anecdotal reports suggest occasional confusion. For example, in one study, a 15-month-old was observed to be apparently looking for real tea in a cup which his mother had pretended contained tea, and a 30-month-old appeared to be looking for real tea to wipe up following a pretend spill (DeLoache & Plaetzer, 1985). Children's occasional failure to keep pretend and real separate is sometimes couched in a larger issue known as Childhood Realism (Piaget, 1929; Wellman & Estes, 1986). Piaget (1962, pp. 167–168) noted that the child "believes" in pretense as "a private reality of his own," suggesting conflating pretense and real.

Here I discuss studies directly addressing children's separation of reality and pretense, then turn to studies looking at children's occasional tendency to behave as if what they were imagining (often inside boxes) had become real, or migrated across a real-pretend boundary. Next I address special pretend entities like Santa Claus, for which cultural support aims to dupe children into thinking pretend entities are real. Finally, I review source monitoring research that provides some evidence that children believe that what they imagined actually occurred.

Explicit Tests of a Pretend-Reality Breakdown

Gregory Bateson (1972) made the point that even animals must to some degree keep a real-pretend boundary in order to behave appropriately when play fighting: "Expanded, the statement 'this is play' looks something like this: 'These actions in which we now engage do not denote what those actions *for which they stand* would denote'" (p. 180). The playful nip stands for the bite, but does not denote what a real bite would denote. Play fighting and pretend then both create a frame, within which actions have their own meanings that are unrelated (in some ways) to meanings in the real world. A boundary separating pretend and real must be maintained even by animals engaging in play fighting. The signs by which animals signal this distinction are discussed more in a later section; the point here is that even animals must to a degree, and in some circumstances, distinguish between acts that one should take for real, and acts that one

should take as play or pretend. This suggests a biological substrate for a pretend-real distinction in all animals that engage in play fighting, including humans (Boulton, 1993; Boulton & Smith, 1992; P.K. Smith, 1997).

Wellman and Estes (1986) showed that young children distinguish between what is real and what is pretended, imagined, and dreamed. Three-year-olds understood quite well the behavioral-sensory properties of imagined/pretended/dream objects versus real objects, in that the latter but not the former could be touched, smelt, and so on. Young children also understood that only real entities had a *public* existence, in that all people experience real (but not necessarily imagined, pretended, or dream) entities similarly, and a *consistent* existence, in that (unlike imagined, pretended, or dream entities) real objects existed regardless of whether anyone was thinking about them. There are some indications that the ages at which children make these distinctions might differ in some populations; for example, Indian children were not reliable in their pretend-real judgments until 5 years old, perhaps due to the increased prevalence of magical entities in their cultural lure (Wahi & Johri, 1994). Variation in the ages at which children pass the Wellman and Estes tasks has also been observed at different preschools within the United States. For example, children at the University of Michigan preschool where Estes et al. tested children were advanced relative to those in community preschools in Oregon (Taylor, Cartwright, & Carlson, 1993). What explains this difference within the United States is a topic for further research.

Transmigration Across a Real-Pretend Boundary

Although children seem able to differentiate real and pretend entities, and even to keep different pretend worlds separate—they know, for example, that Batman does not interact with SpongeBob (Skolnick & Bloom, 2006), and that objects they pretended existed in one pretend game do not migrate into a second pretend game (Skolnick, Weisberg, & Bloom, 2009)—they do sometimes seem to think that what they have pretended has become real. In one major study of this issue (P. L. Harris, Brown, Marriott, Whittall, & Harmer, 1991), 4- and 6-year-olds were asked to imagine various entities, like a cup (an everyday item) or a monster (a supernatural item), and to state if the entities were real and could be seen by the experimenter (see also C. N. & Harris, 1994). Children answered accurately for natural and supernatural entities in Studies 1 and 2.

Studies 3 and 4 examined whether children's *behavior* towards the imaginary objects revealed anything more. Children were directed to pretend everyday positive (puppy, rabbit) or supernatural negative (monster) objects were in boxes. Then, in addition to asking explicit questions about reality status, the experimenters also looked at whether children would stick their fingers in or look inside the boxes. In both studies, children avoided the monster but approached the puppy box. Hence they *acted* like what they had pretended or imagined was real, although their explicit answers to questions about the imagined/pretended objects suggested otherwise.

One difference between the first and second two studies is the instructions, which changed from imagine to pretend. To imagine is to form a mental image, but not necessarily to project it anywhere. In experiments, the mental image is *often* projected to a certain location, so one has an image of a monster in a particular box. Pretending *always* has a location, a place where the image is projected. In addition, although pretending does not necessitate action (cf Friedman, 2013), pretending always has consequences for action should it occur. If I am pretending a banana is a telephone, I might do so without touching it. However, if I do touch it, it has to be with respect to its telephone identity, not its banana one. Imagining, by contrast, is wholly mental. It is possible that the use of different mental state terms, rather than just the behavioral measures, was responsible for the different results within this study.

Focusing on the behavioral result obtained with pretending, Harris et al. proposed two possible reasons for children's anomalous behaviors: (1) Perhaps children think pretend objects can transmigrate from pretend worlds to real ones, or (2) perhaps by thinking of pretend objects as real, children make the objects cognitively available, and because the objects are so available, children then mistake them for real. This would be consistent with Tversky and Kahneman's (1973) finding that merely thinking about something makes adults judge it as more likely to exist or to happen.

Bourchier and Davis (2000a, 2000b) tested this "availability hypothesis": They had children imagine entities that were in transparent boxes, providing incontrovertible evidence that the pretend entity was not in the box. Furthermore, they tested the influence of affect, which some (P. L. Harris, 2000; Lillard, 1994; Samuels & Taylor, 1994; Woolley, 1997) have suggested children take as a cue to reality. To vary affect, they had children imagine negative, neutral, and positive entities in those boxes. Supporting availability, children rarely opened the transparent box. In addition, children responded in ways that bolstered positive affect (looking in the puppy box) and reduced negative

affect (avoiding a scary monster box). This phenomenon, wherein children in some way deny that frightening things are real, has been reported elsewhere with regard to verbal judgments (Samuels & Taylor, 1994).

Bourchier and Davis (2002) reviewed evidence for several possible explanations for pretend-reality breakdowns. One explanation was that behavioral measures might have masked understandings that children have, and they suggested that perhaps verbal measures are more accurate. This is curious, given that in many domains children reveal understandings behaviorally before they reveal them in words (Clements & Perner, 1994; Goldin-Meadow, 1997; Rakoczy, Tomasello, & Striano, 2004). Perhaps one of the methods of getting at the pretend-real boundary lacks validity.

Another explanation they consider is that children check in the boxes because there is no cost to doing so. A study by Woolley and Phelps (1994), in which a child and an experimenter imagined a box contained a sock, and then a second experimenter arrived truly looking for a sock, supported this possibility, because children generally did not hand over the box they just imagined had a sock. They did not engage in a social exchange based on what they had imagined.

Another explanation Bourchier and Davis (2002) consider is the emotional cue reason given earlier: Children experience an emotion when they imagine or pretend about some things, and they use that emotion as a cue to reality. But, they point out, there are cases of confusion without emotion, and emotional pretense does not always result in confusion. Their ultimate explanation is availability, but modified from Harris's original thesis to also consider how affect, individual differences (see below), and context all play a role as well. Interestingly, one study suggests that making fantasy more available *helps* children discriminate pretend and reality. Older children were better able to make fantasy-reality distinctions after watching films with magical content (Subbotsky & Slater, 2011).

Studies thus far have shown that children sometimes mistake what is pretended or imagined for real. Children also sometimes claim that real things are pretend. Two contexts in which this occurs are videos and books. In some studies children were asked to say whether a woman they viewed on video was pretending to have a snack or really having one, and children erred mainly by claiming someone who was really eating was just pretending to eat (Ma & Lillard, 2013; Richert & Lillard, 2004). In other studies children overestimate fantasy with books, claiming that biographies (for example) are not about real people (Woolley & Cox, 2007). Although children of 3 to 4 years are fairly good at judging famous historical figures (Abraham Lincoln) to be real, with unknown figures presented in short vignettes, young children are unable to use magical contextual or true biographical information to make pretend-real distinctions (Corriveau, Kim, Schwalen, & Harris, 2009).

Some studies have found individual differences in pretend-reality discrimination, a possibility also raised by C. N. Johnson and Harris (1994) who categorized children as "credulous" or "skeptics." One individual difference that could contribute to the ability to make pretend-real distinctions is what has been termed a "fantasy predisposition" (J. D. Singer & Singer, 1990; Taylor & Carlson, 1997), indexed by such measures as whether a child has an imaginary companion or prefers reading fairy tales to realistic books. In some studies, a higher fantasy orientation has been associated with a greater tendency to mistake pretend entities for real ones (Bouldin & Pratt, 2001; Woolley, Boerger, & Markman, 2004), but not all studies have shown this (Boerger, Tullos, & Woolley, 2009; Taylor et al., 1993). Theoretically, either case is arguable: Children who pretend less might do so because they draw a clearer line between pretense and reality, which might make it less enjoyable; this could be a reason for the decline in pretending in middle childhood (E. D. Smith & Lillard, 2012). On the other hand, children who pretend a lot might be better at making the pretend-real distinction because practice teaches the distinction. At this point the findings are not clear, nor is it clear whether "fantasy predisposition" is a reliable construct with valid measures.

In sum, a great deal of research has examined circumstances under which children judge that entities have crossed the real-pretend boundary in either direction. In one direction, children sometimes have judged that entities with which children pretended or imagined were actually real. In the opposing direction, children have judged that things that actually are real are only imaginary. Availability can explain many such instances, especially when strong affect is involved, and in particular contexts or frames. One context that clearly is influential is when adults set out to fool children with special entities like Santa Claus.

Special Entities

Entities in which adults actively seek to get children to believe are especially likely to elicit real-pretend confusion. High percentages of very young children report believing in creatures like Santa Claus and the Easter Bunny (Clark, 1995; Principe & Smith, 2008a, 2008b; Rosengren, Kalish,

Hickling, & Gelman, 1994; Sharon & Woolley, 2004). Disbelief in such entities emerges on average at $6\frac{1}{2}$ to 7 years old (Prentice et al., 1978).

Adult verbal testimony and physical evidence are the sources of children's beliefs. Dawkins (1995) argued that it is adaptive for children to believe what adults tell them; to learn everything from personal experience would be inefficient. Grice (1975) argued for credulity even in adults, in that communication has a maxim of quality: It is assumed to be truthful. For the most part, believing adults serves children well. The cultural evidence (from peers, stories, stores, and so on) for certain special entities is so strong that children believe in the entities regardless of the level of parental encouragement, and (for Santa) even when their religious traditions do not include them (Boerger et al., 2009; Prentice & Gordon, 1987; Woolley et al., 2004).

The ubiquity of "cultural infiltration" makes controlled study of the precise sources of children's Santa Claus beliefs impossible. Parents have different ways of presenting such entities, and the dosage of information received by any given child can vary widely. To circumvent this, Woolley et al. introduced children to a "Candy Witch," who, at children's request, replaced candy with a toy on Halloween night (Boerger et al., 2009; Woolley et al., 2004). The evidence for the Candy Witch's existence was supplied at school, with both a discussion or story at circle time and a Candy Witch puppet crafts project. In addition, many parents agreed to simulate a visit from the Candy Witch on Halloween night. Participants were 3- and 4-year-olds in the first study, and 4- and 6-year-olds in the second.

In general, younger children were more apt to believe in the Candy Witch than older ones, and older ones were more convinced by the hard evidence of a visit. Furthermore, in both studies, children's belief in other fantasy figures like Santa Claus predicted their belief in the Candy Witch. This suggests that having a concept of magical creatures that perform particular acts on particular days allows for easier assimilation of another creature of that sort. Children come up with reasonable explanations to justify such beliefs, for example, "Who takes all your teeth if there's no Tooth Fairy?" (P. L. Harris, Pasquini, Duke, Asscher, & Pons, 2006). Presumably it is the improvement in their causal reasoning that later leads children to dismiss their existence.

In sum, a special case of children losing the real-pretend boundary arises when adults try to dupe children into believing in such things. Because children rely on adult testimony (P. L. Harris, 2012), it is not surprising that children are credulous in such cases, especially when hard evidence is supplied. Interestingly, the cultural evidence for some special entities, like Santa Claus, is so strong that children believe even when their own parents do not perpetrate the myth.

Source Memories for Imagined Versus Real Acts

Another way to tap into how well children discriminate what is real versus pretended is to examine their source memories. After having imagined or pretended versus having really done something, how well do children remember which they did? Welch-Ross (1995) had children imagine, pretend, or actually perform various actions, and then after a brief intermission asked children which of the three they had done. Performance improved across these domains from 40% correct, to 59% correct, to 83% correct, respectively. Further, whereas 3-year-olds erred by claiming they really did actions that they had only imagined or pretended doing, 4- and 5-year-olds erred mostly by confusing what they had pretended with what they had imagined, and vice versa. In earlier studies, Foley and Johnson (1985; Foley, Johnson, & Raye, 1983) contrasted imagining doing with really doing, and 6- and 9-year-olds discriminated correctly on 60% of trials. One difference between these studies is that Welch-Ross supplied real objects for real actions and not for pretend ones; the real objects (or their lack) probably strengthened children's memories for the source.

In another study, children were asked to remember which object they had used in various acts: a real one, a nondescript substitute object (a plain wooden cylinder or block), or their hands and arms (Foley, Harris, & Hermann, 1994). Children often misrecalled that they had used a real object when in fact they had used a substitute (object or body part). Thus, although Welch-Ross (1995) suggests children remember what simple action they performed (pretend or real) when they either had a real object or did not, this study suggests that they do not remember what object they used (real or substitute) while performing.

Hence children sometimes mistakenly recall what was pretended, believing instead that it actually really happened. This indicates that source memory traces for pretending and imagining are weak at younger ages and strengthen with age. Foley (2013) suggests that the mental activity involved in planning an action creates a strong motor plan trace in children, which is part of the reason for the confusion. Supporting this, another study showed that young children often actually do actions that they were only asked to imagine or pretend doing (Malvestuto-Filice, 1986). Such findings suggest that perhaps planning systems in the brain, like the premotor cortex, are activated, and whereas adults can invoke inhibitory circuits that prevent

the action from occurring, children often fail to do so. Another finding that could be related to this is "scale errors," for example, young children trying to sit on a very tiny toy chair (Ware, Uttal, & DeLoache, 2010). Perhaps the strength of the motor planning activation is greater in children than in adults; Foley suggests the motor trace is used as an indicator of whether one really performed an act, and thus children misremember.

This raises a more basic issue of how people represent pretended or imagined events differently from real ones. Studies have investigated both the timing and the body mechanics of imagined actions, including both fine and gross motor actions. Regarding timing, a basic finding in both the adult and the child literature is that we imagine events taking place faster than they actually do (Kunz, Creem-Regehr, & Thompson, 2009). Lillard and Witherington (2004) even saw this with pretend actions that were actually performed. The issue of how pretend or imagined and real events are neurally represented is also an important area of research but thus far has concerned only adults (Decety, 1996; Decety & Grezes, 2006; Jackson, Brunet, Meltzoff, & Decety, 2006; E. D. Smith, Englander, Lillard, & Morris, 2013). In the future it will be clarifying to learn how children neurally represent pretend versus real states.

Summary

In sum, research on children's ability to discriminate pretend from real is thriving. Children seem to have a very good basic understanding of how real things differ from pretend ones, in terms of what kinds of interactions they afford. Still, children are confused in some situations. Sometimes they act as if what they merely imagined has become real, possibly because imagining made it mentally available. They are readily duped by adults into believing in impossible creatures like Santa Claus. And finally, their source memories for what they imagined or pretended versus what they really did are often confused.

Initiating Pretend Play

Another contemporary issue in play research is how children are initiated into pretend play. In a major review, Fein (1981) wrote that a mother would certainly never get down on the floor and pretend with her child. Already, however, others had shown that they did (Dunn & Wooding, 1977), and a number of papers in the years soon after provided detailed descriptions of parent-infant play (Crawley & Sherrod, 1984; Dunn & Dale, 1984; Kavanaugh, Whittington, & Cerbone, 1983; Miller & Garvey, 1984). American mothers pretend in front of their children as early as it has been examined—7 months (Kavanaugh et al., 1983). Haight and Miller (1993) found every mother (of the nine they observed) pretended with her 12-month-old child, when just half the children pretended themselves. Early mother-child play differs from play alone or with peers and siblings in at least four ways: (1) It is more advanced; (2) mothers quickly move into spectator roles, whereas peers remain as engaged as the child; (3) it is more apt to involve replica toys; and (4) it more frequently involves reenactment of cultural scripts (Lillard, 2011).

Yet mothers' early engagement in pretend play with their infants poses a quandary. Infants are relatively ignorant, and pretending is a deliberate misconstrual of reality. When mothers are pretending with children, they are giving wrong information to someone who does not know much, and for whom the mother is a key source of information. We established in the prior sections that, for the most part, children are fairly good at maintaining a pretend-real boundary by the time they are in preschool, and logic would suggest they have to do so even earlier in life or they would be very confused by early parental pretense. How is confusion avoided?

Some hints at how confusion might be avoided can be found in the animal literature: For animals, play fighting must be signaled to distinguish it from real fighting (G. A. Bateson, 1972). One signal is the canid "play bow" in which dogs and wolves lower their shoulders towards the ground while keeping their rumps at their normal standing level (Bekoff, 1977). Another is high-pitched noises rats produce prior to play (Knutson, Burgdorf, & Panksepp, 1998). Primates produce a "play face" which involves a widened mouth and bared teeth (Eibl-Eibesfeldt, 1989; Palagi, 2011). Many other animals use specific locomotor patterns in play, for example, rats' play bites are aimed at the nape of the neck, whereas their real bites are aimed at the rump (Pellis & Pellis, 2007). How might human parents signal pretend play for their young?

Early studies of this issue found evidence that mothers use a higher pitched voice when pretending (Reissland & Snow, 1996) and special "interaction frames" (Reissland, 1998). In a more comprehensive search for cues, we had mothers engage in a real snack and a pretend snack, for 2 minutes each, with their 18-month-olds (Lillard & Witherington, 2004). Many significant differences were observed across the scenarios. When pretending, mothers looked at their children more; when really snacking, they looked relatively more at the snack. When pretending mothers smiled more, and the smiles were of longer duration, with

many of them long enough to qualify as "false smiles" (Ekman & Friesen, 1982). Mothers engaged in more snack related actions, and many of those actions occurred more quickly in pretense. One action, holding the pitcher at the cup to pour, took too long in pretense (relative to its duration when really pouring), and was also exaggerated in space. Mothers talked more when pretending, and that talk was more often about the present implements and actions (not the imaginary pretend objects). There were also more references to "we" and more sound effects when pretending. A Japanese group recently replicated this study and found all the same differences, with a much more marked difference in sound effects: Japanese mothers were particularly prone to use "onomatopoeia" (Nakamichi, 2014) in which the sound of an act and the name of the act are similar. A further study with 15- and 24-month-olds using the Computer Speech Laboratory did not find higher pitch (in contrast to Reissland and Snow) but did find more pitch variability (Lillard et al., 2007).

An ensuing question is whether infants can use these behavioral changes to register that the parents' behavior reflects pretending and is not to be taken seriously. In animal play-fighting, signal reading is assumed when the play partner continues to play, rather than becoming truly aggressive. Using a similar logic, we examined whether children participated in the mother's pretend game by pretending to eat and drink themselves. A second behavior we interpreted as suggesting that infants understood their parent to be pretending was smiling. First, we calculated correlations between mothers' pretend behaviors and children's pretend behaviors and smiles. The maternal behaviors that were best correlated with children's pretend behaviors and smiles were mothers' smiles and looks to the child. Refining this approach we used sequential analyses (Bakeman & Gottman, 1997; Bakeman & Quera, 1995) to determine whether particular sequences of maternal behavior were especially likely to lead to our presumed indicators that infants understood pretending. There was such a sequence, which we likened to a social referencing sequence: Mothers locked eyes with the child, engaged in a pretend act, then smiled (Nishida & Lillard, 2007). This sequence was followed by a child's pretend act or smile significantly more often than would be expected by chance, and this was not due to mirroring as mirroring sequences (mother smiles–child smiles, for example) did not occur more often than by chance. Nakamichi (2014) also found that mothers' signs at 18 months predicted children's understanding of pretense at 24 months, using Harris and Kavanaugh's methods.

A different approach to whether the signs were indicative was to play tapes of the mothers pretending back to older children and adults. Using this approach, we found that by age 4 children could discriminate when mothers were having real versus pretend snacks from watching just 30 seconds of the behaviors (Reissland, 1998; Richert & Lillard, 2004). Slightly younger children were more challenged. When shown two adults side by side, one pretending (with all the signs just discussed) to eat from a covered bowl and the other really eating from a different covered bowl (with the food never visible), and asked to indicate which bowl had the real food, on the first trial only 3-year-olds succeeded by uncovering the bowl, and 2.5-year-olds succeeded by simply pointing at the bowl (Ma & Lillard, 2006). They were at chance on three subsequent trials and overall. This performance pattern suggests that young children's understanding of pretense based on the signs alone is very fragile. One interesting finding was that indicators of implicit understanding, such as smacking lips and reaching for the bowl with real food, were actually detectable at the earliest age tested: 24 months. Children engaged in these behaviors significantly more often when watching someone really eat a snack than they did when watching someone pretend to eat a snack.

In sum, in contrast to the view that pretending is initially solitary and only later becomes social, it is now clear that pretending emerges socially, and is very much supported by maternal engagement at least in some cultures (exceptions are discussed below). Further, there are specific behavioral differences in pretend, especially a behavioral sequence of locking eyes, engaging in the pretense behavior, and then smiling, that appear to communicate pretending to young children. Given that these "signs of pretense" include an emotional expression, an interesting question is how pretend emotions are signaled to young children. Another interesting question is the age at which children begin to use these signs to convey their own pretending.

Does Play Improve Developmental Outcomes?

Play has been assumed to confer so many benefits on children (Elkind, 2007; Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009) that it is claimed to be "a child's work" (Paley, 2005), and even *necessary* to optimal development (Ginsburg, 2007). This section reviews evidence for this claim with regard to nonsocial cognitive outcomes like intelligence, and ends by considering emotion regulation and play therapy. The issues of whether pretend play might help develop theory of mind and problem solving

were discussed earlier. Much of the research concerning whether play helps development has specifically concerned pretend play and hence it is the topic in this discussion, which derives from a recent review (Lillard et al., 2013); additional references can be obtained there. Readers are referred elsewhere for reviews of the benefits of locomotor play (often operationalized as recess or school gym classes; see Pellegrini & Bohn, 2005) on children and play fighting in animals (Pellis & Pellis, 2009).

Nonsocial Cognitive Outcomes

Pretend play has been claimed to influence several nonsocial cognitive outcomes, such as creativity, reasoning, and conservation. First we consider creativity. One might well expect pretend play to help children become more creative (P. Bateson & Martin, 2013), because in pretend play, children often think about situations and objects as other than they are. Lillard et al. (2013) examined seven studies correlating preschoolers' creativity with their level of pretend play. In these studies, children's pretend play was typically coded on the playground for 1 to 5 minutes per day, for 20 or more days. Creativity was most often operationalized with the Alternate Uses task or the Torrance Creativity in Movement and Action test. In the Alternate Uses task, participants are shown a picture of a common object, like a napkin, and asked to think of as many uses of the object as possible. Overall total and total number of unique responses (uses not given by anyone else in the sample) are scored. The Torrance test includes this test, and also asks children to perform actions such as "move like trees in the wind," and judges code how creatively they do so. Some correlational studies found a positive correlation between pretend play and creativity but others did not, or found it only for some types of play or creativity. The relation between pretend play and creativity was also examined in short term experimental and longer term training studies. Again, the results were inconsistent. One possible reason for such inconsistency could be that experimenter bias drove results when they were seen. In studies in which experimenter bias was not possible (e.g., P. K. Smith and Whitney [1987] used experimenters who were blind to training condition), no creativity effects were found.

In another experimental study that found an effect of play on creativity (Howard-Jones, Taylor, & Sutton, 2002), 7-year-olds were asked to make collages, the creativity of which was rated by a panel of blind judges. Prior to collage-making, children either played with salt dough or copied words down from the board. The salt dough group made more creative collages, but it is unclear whether playing with salt dough made these children more creative, or copying words made the other group less creative. Finally, training studies that controlled for adult contact have suggested that more adult contact, rather than pretend play, leads to more creativity; pretend play groups often have more adult contact, creating a confound. In sum, possible experimenter bias, control group experience, and confounded play conditions could explain the pattern of inconsistent results regarding pretend play and creativity.

Several studies have looked at the possible influence of pretend play on intelligence, inspired by a seminal study by Smilansky (1968) in which she speculated that lower-income children's deficits on intelligence tests could be caused by their reduced incidence of pretend play; she did not test this hypothesis, but she did train children to engage in more pretend play, and many other studies went on to use these training methods. However, as with research on creativity, there are problems with failed replications, and when adult contact was controlled there were no effects. In one study using blind experimenters and random assignment, elementary school children in music lessons advanced in intelligence, but those in drama lessons did not (Schellenberg, 2004); however, other studies have not consistently found the music-intelligence relation (Mehr, Schachner, Katz, & Spelke, 2013).

Several studies have examined whether pretend play might influence reasoning, by presenting premises in a pretend versus a real context. When false premises are presented in a pretend context, preschoolers are much better at reasoning from them. For example, if told, "All cats bark. Rex is a cat. Does Rex bark?" children under 5 years old are apt to erroneously say no, but if told first, "Let's pretend that on another planet, cats bark," children are much more likely to respond logically to the syllogism. This has been interpreted as showing that pretend is a facilitating context for reasoning. However, follow-up research by Harris and Leevers (2000) indicated that what helped children was not the pretending *per se*, but rather, the fact that the instruction got children to take a "considered stance" towards the premises. They found that a number of different interventions that also got children to reflect prior to giving an answer resulted in improved performance. An interesting question raised by this research is whether in general, children who engage in more pretend play are better at syllogistic reasoning.

Another area of research in which pretend play has been thought to promote positive outcomes is conservation: realizing that objects retain core properties when undergoing certain transformations. For example, a ball of

clay has the same weight whether it is shaped as a ball or rolled into a long cylinder. The ability to keep one reality in mind while pretending something else seems conceptually equivalent to conservation. Empirically, however, the idea has not stood up well. Three correlational studies found no relation between pretending and conservation. Some training studies did appear to find positive results, but later training studies controlling for extraneous factors did not. Specifically, in the earlier studies, the questions asked during pretend training appeared to tutor children in conservation, and this questioning, rather than the pretending, was what helped children.

Several studies have looked at the relation between pretend play and language, based on the idea that symbolic skills emerging in the end of the sensorimotor period underlie both abilities (Werner & Kaplan, 1963). Indeed, many studies show that pretend play and language are correlated (McCune, 1995). This has led to some claims that pretend play "contributes greatly to language development" (E. Miller & Almon, 2009, p. 209). However evidence for a causal relation is wanting; it seems more likely that there is a bidirectional relation or a relation from a single underlying factor to both pretend play and early language. With regard to literacy, there is evidence that play with literacy materials (like a pretend post office, which leads children to write letters and read envelopes) increases literacy (Neuman & Roskos, 1992; Roskos & Neuman, 1998; Roskos, Christie, Widman, & Holding, 2010). It is likely that play with a variety of materials increases children's ability to interact with those materials, perhaps partly by promoting interest and motivation. Capitalizing on this to harness it for the skills we want children to have—like math and literacy and social skills—is certainly useful.

Research on the relation between children's pretend play and their ability to tell narratives is also inconclusive. Although the two activities seem very much aligned, because pretend play is "story in action" (Paley, 1990, p. 4), three studies correlating naturally occurring pretend play with narratives had contradictory results, and results from experimental studies were also mixed, sometimes showing a positive effect for play, but other times showing that a control group performed better. Training studies provide the best evidence. They have looked at the effect of pretend play training on story memory and comprehension, and have found that children who were trained to reenact stories did better than children who discussed or drew pictures about the stories. However, a study comparing whole-body reenactment with puppet reenactment suggested that embodied cognition, rather than pretend play, was responsible (Marbach & Yawkey, 1980). When children pretend with their whole body they are embodying what they are thinking, and this embodiment, rather than the pretend play alone (which can happen with puppets and dolls) appears to be what caused the change. Still, given that pretend play does often involve the whole body, it can be a venue for narrative development.

Studies concerning whether pretend play helps develop executive function (EF; see Müller & Kerns, Chapter 14, this *Handbook,* this volume) are also inconclusive. Some studies show correlations with social play, but not with pretend play (Fantuzzo, Sekino, & Cohen, 2004; Kelly, Hammond, Dissanayake, & Ihsen, 2011). In the Kelly et al. study, there was a relation between EF and a laboratory measure tapping pretend play understanding, but the latter task itself appeared to require EF. Other studies have shown relations only to specific tasks, or among specific subsets of children. Manuilenko (1948/1975), for example, found that only 4-year-olds (not 3-, 5-, or 6-year-olds; group sizes were small and no statistics were done) could stand still longer when they were pretending to be a guard in a game and other children were present, than when pretending to be a guard without others present or while not pretending. In another study, delay of gratification was related to play as assessed by a child interview but not a parent or teacher interview; the fact that the child interview occurred just after the delay task allows for experimenter biasing (Cemore & Herwig, 2005). In one of the most-cited studies, Elias and Berk (2002) found that preschoolers' social pretend play was related to their behavior at clean-up time 4 months later, but not to their inhibitory behavior at circle time. In a later study, however, a negative relation was found between preschoolers' social pretend play and their later clean-up behavior (Harris & Berk, 2003, as cited in Berk, Mann, & Ogan, 2006). Failures to replicate have also been problematic for claims that Tools of the Mind, a preschool program that emphasizes pretend play, improves children's self-regulation (see Lillard et al., 2013, for references).

Emotion Regulation Outcomes

Another way in which pretend play has been thought to influence children is by modifying cognitive representations, which could then influence their emotion regulation and psychological well-being (Russ & Fehr, 2013). One venue for such pretend play is play therapy, which substitutes for talk therapy with young children because their verbal skills and self-insight are insufficient for the talk

approach (Klein, 1930). Theoretically, with a sympathetic therapist, toys, and the freedom of self-expression, the child can express anxieties and work those anxieties through to resolution (Axline, 1989; Guerney, 2001). Bretherton (1989) supported this underlying idea in suggesting that emotional mastery was the sole function of play that could not be well accomplished by other means.

Play therapy is based on two premises: (1) the child expresses his or her psychological state through play, making play a window into the child's mind, and (2) by directing children's play, the therapist can help resolve a child's conflicts. Regarding the first premise, whether, when, and to what degree children's play is expressing their inner psyche is unclear. There are occasions where it seems quite likely (Haight, Black, Ostler, & Sheridan, 2006; Paley, 2005; Volterra, 1984). For example, children complete stories (by playing them out with dolls) concerning attachment events in ways that mirror their own attachment style (Bretherton, Prentiss, & Ridgeway, 1990). On the other hand, children render many different events and emotions in their play, and how often these reflect issues children are actually experiencing versus are simply exploring is not known. The second premise, that play therapy resolves children's inner conflicts, is debated. Two meta-analyses found it to be as effective as other therapies and as effective as psychotherapy with adults, with medium to large effect sizes (Leblanc & Ritchie, 2001; Ray & Bratton, 2010). However, there are some problems in the research on which these meta-analyses were based that would suggest caution (Phillips, 2010). One major problem with the existing literature on pretend play therapy is that typically parents provide the therapy and the outcome ratings. As therapy providers, parents have a vested interest in the outcome, and the strongest effects are seen when parents provide both the therapy and the outcome ratings. Second, if children do benefit from parent-guided play, such benefit could be derived not from the play, but from the focused parental involvement, just as adult interaction appeared responsible for some findings on the benefits of pretend play for cognitive outcomes. A related concern is that control groups were often no-intervention groups. In sum, better experimental designs are needed to establish whether pretend play therapy is effective at helping children cope with emotional and psychological difficulties.

Better experimental designs have been used to study whether play can help reduce children's anxiety about medical treatments. As an example, in one study children who were being hospitalized for surgery were presented with a puppet show familiarizing them with the equipment and procedures involved, after which they could play with the puppets and ask questions (P. Johnson & Stockdale, 1975). Pre- and posttest measures of children's anxiety showed that it was significantly reduced by the intervention. The presumed reason was that the puppet show provided information. If this is correct, then play is a useful way to convey information to children, but again it is not the play itself that helps, but rather the information.

Other studies have also suggested script reenactments might help children to regulate their fears and anxieties. Milos and Reiss (1982) assigned preschool children with separation anxiety to several sessions of free play, directed play, or modeling with toy school props. Before and after the intervention, their teachers rated anxiety and researchers coded speech disturbances (incomplete sentences, stuttering, and so on). There was no effect of condition on teacher ratings, but all three experimental groups had fewer speech disturbances in response to the separation-relevant questions than the control children, and the higher the quality of play children exhibited, the less speech disturbance was recorded. Barnett also conducted two studies looking at whether play might reduce anxiety (Barnett, 1984; Barnett & Storm, 1981); the later study suggested that playing alone (versus with others) might particularly help anxious children.

In sum, there are some suggestions that pretend play helps emotion regulation, with the best evidence coming from the medical treatment literature in which children play out medical procedures prior to undergoing the actual procedures. This makes good sense—creating mental structures in advance helps us to process information, and understanding what we are about to go through does usually reduce anxiety about it. Currently much of the evidence on this issue is clouded by questionable methods; future research should address these problems and also consider the mechanisms by which play might have effects.

Summary

The prior review by Rubin et al. (1983) devoted about 8 of its 69 pages to the correlates and outcomes of play, and concluded that although pretend play might provide opportunities to develop social and cognitive skills, there was no clear evidence of a direct benefit of play because of methodological problems. Thirty years and many studies later, the situation is unchanged. Although one reads claims that pretend play benefits development (Ginsburg, 2007; Hirsh-Pasek et al., 2009; Miller & Almon, 2009), our recent review of over 150 studies concluded that, "Despite

over 40 years of research examining how pretend play might help development, there is little evidence that it has a crucial role" (Lillard et al., 2013, p. 27).

INTERINDIVIDUAL DIFFERENCES IN PLAY

In this section I consider how play develops in boys versus girls, and in children with sensory deprivation and on the autism spectrum. I end by addressing play in cultures that vary importantly from American culture, in which most of the evidence on play has been gathered.

Gender Differences in Play

In their chapter on play, Rubin et al. (1983) noted that boys and girls play differently in ways that reflect stereotypical masculine and feminine behavior, and also reflect gender differences seen outside of play settings. For example, boys and girls prefer different toys, such as trucks and dolls, respectively (Cherney & London, 2006). Boys' play is more likely to be aggressive and competitive than girls' (Maccoby, 2002; Pellegrini & Smith, 1998). As noted earlier, boys engage in more exercise and rough and tumble play. Boys also prefer adventurous games like cowboys and Indians, whereas girls engage in more domestic play (McLoyd, 1980; Pulaski, 1973). Thematic differences are also reflected in imaginary companion play, with boys preferring to impersonate superheroes, and girls tending to create companions for whom they care (Taylor, 1999). Studies are ambivalent regarding gender differences in overall levels of pretend play, with some studies reporting that girls pretend more and others reporting that boys do; because boys and girls tend to play with different types of toys, it seems likely that toy availability underlies these discrepancies (Rubin et al., 1983).

Gender differences in play can arise from many other sources as well (Ruble, Martin, & Berenbaum, 1998). One is social influence (Dunn & Dale, 1984). In addition to sometimes modeling gender stereotyped behaviors, parents often encourage and reward gender stereotyped play (Fagot & Leinbach, 1989). A second source of gender differences in play is children's cognitions about gender. Gender Schema Theory (Bem, 1981) proposes that children first learn what is expected of each gender and then, after identifying themselves as male or female, begin to act according to those expectations. Children learn early that lipstick belongs with females, and trucks with males (Poulin-Dubois, Serbin, Eichstedt, Sen, & Beissel, 2002). A third possible source of gender differences in play that has ascended to prominence in recent years is biology.

Recent research shows that biological factors undergird several aspects of play. For example, prenatal exposure to high levels of male sex hormones is associated with girls engaging in more rough and tumble play, and preferring stereotypical boys' toys; the reverse is true of boys for whom prenatal testosterone uptake is blocked (Berenbaum & Hines, 1992). Furthermore, even vervet monkeys show toy preferences for human toys that correspond to gender stereotypes (Alexander & Hines, 2002). When typically masculine (a ball and a car), typically feminine (a doll and a cooking pot), and neutral (a book and a stuffed animal) toys were made available, male vervet monkeys spent more time with the masculine toys than did females, and females spent more time with feminine toys; there were no gender differences in contact with the neutral toys. Rhesus monkeys show these same differences (Hassett, Siebert, & Wallen, 2008).

Hassett et al. speculate that preferences for gendered toys are derived from other kinds of play preferences. These other preferences are known to stem from prenatal exposure to androgens, which influence neural development. Toy preferences might be driven to some degree by what kinds of activities the toys afford (Eisenberg, Murray, & Hite, 1982). Boys and male monkeys alike might be attracted to toys that facilitate more large motor movement, whereas girls and female monkeys might be attracted to toys that encourage less energy expenditure, and this could be due in part to prenatal androgen exposure. However, one study did not find that prenatal amniotic testosterone predicted gender stereotyped toy preferences in children 3 to 5 years old (Knickmeyer et al., 2005), highlighting that there are multiple sources of influence on human play.

In sum, there are marked differences in the play of boys and girls that align with gender stereotypes and differences seen in other settings. As in other settings, such differences stem in part from social influences and children's knowledge about gender expectations. In recent years, accumulating evidence has also pointed to biological influences on gender typed play, likely stemming from prenatal androgen exposure.

The Play of Atypically Developing Children

Typically developing children virtually all engage in play on a well-established schedule, as discussed earlier. Atypically developing children (e.g., blind and deaf children)

show some differences in their play, particularly in their pretend play. This is not surprising when considering that pretend play often emerges in the context of social interactions with parents, who emit observable signs of pretense. Atypically developing children can differ in access to those signs. Children on the autism spectrum have different social interactive experiences, as do children who have experienced severe social deprivation, which would also interfere with perceiving those signs.

Blind Children

Many blind children do engage in pretend play (Fraiberg & Fraiberg, 1977), alone and (particularly) in collaboration with sighted children (Troster & Brambring, 1994). However, their pretend play is delayed in onset, and at any given age they pretend less and/or at a lower level than their age-mates (M. Hughes, Dote-Kwan, & Dolendo, 1998; Lewis, Norgate, Collis, & Reynolds, 2000; Preisler, 1995). The degrees of blind children's deficits in pretend play are tied to their social skills. In fact, 6- to 8-year-old blind children with unimpaired social skills play similarly to sighted peers matched for mental age (Bishop, Hobson, & Lee, 2005). Future research should examine whether this is the case in preschool as well.

Given the importance of parents' visual signals in initializing pretend play, blind children would seem to be at a considerable disadvantage. As was described earlier, mothers typically signal pretending with visual cues in a particular sequence: They lock eyes, engage in a pretend act, and then smile. A blind child would not have access to this cue sequence. Even once a blind child began to pretend, social pretend play would continue to be challenging because its content is also often communicated through visual means (Bishop et al., 2005). One knows another person is pretending a banana is a telephone in part because one sees the person holding the telephone at the mouth while talking. Pretending with blind children would require providing pretend information in different ways to get the pretend meaning across. The fact that many blind children pretend by Ages 6 to 9 suggests either that nonvisual signals are sufficiently provided or that the children began pretending in the absence of signals. A second possible reason for the delay in blind children's pretense production is lack of modeling. Sighted children are likely to get ideas for pretending from seeing others pretending, including seeing the objects others use as substitutes. In sum, blind children are delayed in their pretend play, perhaps because of not having access to the signs of pretense nor to pretense behaviors being modeled in perceptible ways.

Deaf Children

Some studies find deaf children are also delayed in the onset of pretend play (Brown, Prescott, Rickards, & Paterson, 1997; Higginbotham & Baker, 1981), but this delay appears to be tied to and dependent on language delays (Spencer, 1996). Although they have access to the visual signs of pretending, lack of verbal communication for deaf children with hearing parents delays intersubjectivity (Prezbindowski, Adamson, & Lederberg, 1998), which is central when parents communicate that an act is pretense. Further research should examine whether the delays in pretend play and intersubjectivity also occur with deaf children of deaf parents, because this population is not delayed in some related developments like theory of mind (Peterson & Wellman, 2009).

In contrast, deaf children of hearing parents are delayed in theory of mind (Peterson, 2004). More important to the current discussion, in this population understanding of pretend comes in before understanding of knowledge access, as suggested by the fact that pretense understanding occurs in a different position on the Theory of Mind Scale (Peterson & Wellman, 2009; 2004). Knowledge access entails realizing that a person who has not seen inside a nondescript container (like a drawer) will not know what is inside of it. The pretense understanding task used in the Peterson and Wellman (2009) study (but not in most studies using the Scale) involves the child and experimenter pretending to paint a red car blue. Pretending is explicitly stopped, and the child is told another person is coming; the question is, will the new arrival think the car is blue or red? The correct answer to this question is to report red, but some children claim the new person will think the car is blue, overextending their own pretense representation to a person who is not involved in the pretense stipulation. Typically developing children pass this pretense understanding task after they pass knowledge access and before they pass false belief. Deaf children, although they pass each task later overall (in chronological terms), understand pretense prior to knowledge access. The reason for this difference is unclear. Yet because of this relative difference in when deaf children pass the pretense task, Peterson and Wellman (2009) suggest that pretend play training might be a promising intervention to help deaf children develop theory of mind.

Children on the Autism Spectrum

Children on the autism spectrum show clear deficits in pretend play (Rutherford, Young, Hepburn, & Rogers, 2007; Ungerer & Sigman, 1981); indeed, it has long been recognized as a primary symptom of the disorder (American

Psychological Association, 2000; Kanner, 1943). Wing and Gould's (1979) triad of difficulties in autism included deficits in imagination alongside deficits in communication and repetitive/stereotypical behaviors. Thus, unlike typically developing children, children with autism are unlikely to animate dolls, have pretend tea parties, or play cowboys. Lack of pretend play at 18 months predicts a later diagnosis of autism (Baron-Cohen, Allen, & Gillberg, 1992), and pretend play is a major component of the widely used Autism Diagnostic Observation Schedule (ADOS) (Lord et al., 2000). There are several theories of why children with autism show deficits in pretend play, including that it stems from a deficient theory of mind, lack of executive control, or their different social exchanges.

In the seminal study linking autism and pretend play to theory of mind, Baron-Cohen (1987) studied the pretend play of 10 children on the autism spectrum, 10 children with Down syndrome, and 10 typically developing children, matched for mental age. Children were given toys for 5 minutes each, and their play was coded. Children with autism showed more sensorimotor and functional play, and less pretend play, than the other two groups. The children with autism also did very poorly on false belief tests. Baron-Cohen hypothesized that the deficit in pretend play reflected an impaired ability to symbolize, a skill also needed for theory of mind, as discussed earlier (Lillard & Kavanaugh, 2014).

Leslie (1987), whose theory was also discussed earlier, provided a somewhat different analysis. His claim was that the reason children with autism do not pretend is that understanding pretend acts requires mind reading. A child must realize that the pretender has a different situation in mind. Further, that different situation must be quarantined from the real situation as the child makes sense of the pretense. Leslie claimed that the same cognitive architecture that allows children to pretend also allows them to make sense of pretense in others and to understand false belief. Children with autism, he maintained, are impaired in this architecture.

A problem for both of these accounts arises from the fact that many children with autism do pretend some, especially as they get older (Charman et al., 1997). Even in Baron-Cohen's study, 20% of the children with autism pretended. (Also problematic is the fact that a subset of the children with autism passed false belief, and that the size of that subset increases with age as well—see Rajendran & Mitchell, 2007.) Others have shown that when pretend play is prompted, older children with autism engage in it (Lewis & Boucher, 1988). Another issue is that children with autism do not appear to have as much difficulty comprehending others' pretense as the theory of mind account would imply (Kavanaugh, Harris, & Meredith, 1994). It is conceivable, however, that children with autism could follow pretense transformations without pretending *per se*.

In favor of the theory of mind account, the pretend play of autistic children, when present, is different in quality; it has been characterized as "limited, sterile and ritualized" (Hobson, Lee, & Hobson, 2009, p. 12). It is also much less apt to be generative or spontaneous (Jarrold, Boucher, & Smith, 1996; Lewis & Boucher, 1995; Rutherford et al., 2007); children with autism appear to be less motivated to pretend than are typically developing children. Scott (2013) suggests individuals with autism have a deficit in "spontaneous imagination," or in spontaneously seeing things as other than they actually are.

A different account for the pretend play deficit in children with autism is that it arises from poor executive control (Jarrold & Conn, 2011). Supporting this, several studies have shown that children with autism also have executive control deficits, as revealed by problems with planning, inhibition, and set shifting (C. Hughes, Russell, & Robbins, 1994; Russell, 1997).[1] Executive control could also influence many features of pretend play, as mentioned previously.

Executive control difficulties in autism might also be tied to differences in generativity or spontaneous pretense. Children with autism have particular difficulty with object substitution and less difficulty with pretend properties (Jarrold & Conn, 2011). Substituting a whole object might require more generativity than simply assigning a different property, because one has to think about the whole object and all its aspects differently. For the same reason, it also might require greater inhibition than merely substituting a property.

Autism indisputably leads to different kinds of sociocultural interactions, which could largely be responsible for the lack of pretend play (Hobson et al., 2009). Children with autism do not engage others, and in response others do not engage with them. This creates a very different interactional environment, and, as we saw earlier, pretend play gets off the ground in interactional contexts; it is

[1] A problem for this account is that children with other forms of developmental delay also have executive deficits; they are not specific to autism (Dawson et al., 2003). In addition, very young children with autism have no deficit in EF (Rajendran & Mitchell, 2007). Furthermore, there are different accounts regarding EF deficits in autism (Hill, 2004).

about shared meaning and intersubjectivity. The roots of pretend play are in joint attention activities. For this reason, some researchers have examined whether joint attention predicts pretend play in children with autism, and have found that it does (Rutherford et al., 2007). Interestingly, joint attention also predicted pretend play development for typically developing and developmentally delayed children. By contrast, imitation was unrelated to pretend play development. As Rutherford et al. (2007) explain, "If affect is not easily or spontaneously shared, reflected and experienced in young children with autism, the typical motivation or reinforcement for engaging in pretend play with another may be reduced" (p. 1036). Pretend play and joint attention likely have a reciprocal relation: A certain level of joint attention is needed to get play off the ground, after which pretend play fosters the development of joint attention. Children with autism show deficits in both areas.

Many researchers are examining play as a potential intervention for children with autism (Kasari, Huynh, & Gulsrud, 2011). Supporting this, the levels of play (in particular, using combinations of actions) in children with autism at 3 to 4 years of age predict language ability 5 years later (Kasari, Gulsrud, Freeman, Paparella, & Hellemann, 2012). Language is the most important predictor of outcomes for children on the autism spectrum, making this potentially a very important finding.

In sum, there are many theories regarding why children with autism show deficits in pretend play, including deficits in executive function, theory of mind, the social environment, and an early lack of joint attention. A recommendation for research on autism and pretend play is that researchers use clearer categories both in diagnosis and in outcome measures; this is also important for developing play interventions for autism. Autism is a multifaceted spectrum disorder. Particular areas of deficit might respond better or less well to pretend play interventions. Second, noting what forms of pretend play are impacted by autism is important; some possibilities are attribution of properties, creation of imaginary objects, and object substitution. Pretend role enactment, in which a child plays out roles suggested by others, and role play, in which a child announces his or her identity and plays it out, could also be important to examine. Any or all of these could be impacted by training children with autism to pretend, and knowing what types of pretending assist their development could not only serve a therapeutic purpose but could also inform our understanding of pretend and development more generally.

Early Social Deprivation

Research described thus far points to how intersubjective experiences lead to the emergence of pretend play at 12 to 18 months, and illustrates that pretending is delayed in children who for various reasons do not have these experiences. Other research suggests the crucial period for such experiences is even earlier than one might suppose. This evidence comes from a study of children adopted from Romanian orphanages after the fall of the Ceauşescu regime in 1989 (Rutter et al., 2007). In these orphanages children had very little interaction with caregivers; although they were fed and toileted, they were treated in many ways more as objects than as people. Among children who had spent their early lives in these orphanages, pretend play was significantly impaired relative to that of children adopted within the UK. In fact, Romanian children were no more advanced in their pretend play when they had been adopted prior to 6 months old than when they had been adopted between 6 and 24 months old. Using age at adoption as a continuous variable, among the Romanian children pretend play and age at adoption were not significantly correlated. This is unusual among the Romanian orphanage findings; in general, earlier adoption ages are associated with better outcomes. The implication is that social interactions in the first 6 months of life are crucially important to the emergence of pretend play later.

Summary

Taken together, results from special populations clearly support the idea that pretend play originates in social interaction. Children whose social interactions are atypical or disrupted—whether it be because of autism, blindness, deafness, or certain institutions—engage in pretend play less than other children, and on a delayed schedule. Intersubjective engagement very early in life appears to set children up to understand, and then engage in, pretend play in later years.

Play Across Cultures

Play is a ubiquitous childhood activity across cultures (Eibl-Eibesfeldt, 1989), and the subset of pretend play is also believed to be universal both in timing and appearance (Fein, 1981; Haight, Wang, Fung, Williams, & Mintz, 1999). When an activity is universal in a particular developmental period, it is often assumed to have been selected for because organisms that engaged in it produced more offspring. It has been assumed that pretend play exists

because it helps development in some way (Pellegrini, Dupuis, & Smith, 2007). I have suggested that existing research does not convincingly show this for pretend play, but for play more generally there is ample research in animals suggesting an important developmental role (Pellis et al., 2010) that could also apply to humans. Alternatively, perhaps children have evolved to play because play kept children out of adults' way, freeing adults to do important survival-related activities (Gosso, Otta, Morais, Ribeiro, & Bussab, 2005). Children who did not play, away from adults, would by these lights not have survived to bear children of their own.

Aside from the fact that childhood play is universal, it is characterized by tremendous variability across culture and social class. Here I review several aspects of that variation: the amount of time devoted to play, the types of play engaged in, play partners, and finally adult cultural beliefs about play (which influence many features such as materials, space, and time provided for play).

Amount of Time in Play

The amount of time children spend in play appears to vary across culture and social class. Feitelson (1977) speculated on four reasons for this variation: (1) availability of time; (2) availability of materials; (3) availability of space; and (4) adult endorsement. An important preliminary issue with regard to quantifying time in play concerns the categories of play coded.

Some studies focus on many forms of play, whereas others are confined to pretend play. Even when many forms of play are coded, researchers' cultural backgrounds dictate what those forms are. The forms researchers privilege are often rooted in Piaget's categories of sensorimotor (object) play, symbolic play, and games-with-rules, with locomotor or physical (rough and tumble) play occasionally included. Forms of play that are less common in European and Euro-American cultures, like finger, sound, and language play, are typically excluded (Heath, 1983). In fact, studying play at all is culturally determined. For example, Turkish peasant parents have expressed surprise to researchers that importance was being accorded to something as trivial as children's play (Göncü, Jain, & Tuermer, 2007). Hence cultural factors determine whether play is studied at all, and once it is studied, they determine what categories of play are coded. The validity of our measures of children's "time in play" can be questioned on this basis.

Another difficulty in determining the time children spend in play is that children often manage to insert play into work (Edwards, 2000; Gosso, 2010). For example, children who are asked to run an errand might stop to jump rope along the way; or (as in the example given earlier) children who are asked to care for a younger sibling and clean house might engage the sibling in pretending to be maids. Coders who were not privy to the script might observe the children and only see them cleaning house.

Despite these difficulties, several researchers have estimated the amount of time children spend in play. Time use studies of middle-class American children Ages 2 to 6 show they typically spend about 30% of their waking hours engaged in play, compared to about 20% for Senegalese children (Bloch, 1989). Tudge et al. reported that for 3-year-olds, percentage of observation time devoted to play ranged from 50% to 60% for middle- and working-class children in the United States, Kenya, and Brazil (Tudge et al., 2006). Other studies have found greater differences both across cultures and social classes in time spent in play. In the Six Cultures study, in which all but the U.S. observations were done in agricultural subsistence communities, 4- to 5-year-old Kenyans were engaged in play in just under 20% of observations and Indian children in about 25% of observations, in contrast to about 85% of observations in Okinawa (Edwards, 2000). Children in the United States, Mexico, and the Philippines averaged around 50%. Regarding pretend play specifically, Block (1989) found similar amounts in the United States and Senegal. Looking only at pretend play in middle-class American homes, Haight and Miller (1993) estimated that between 3 and 4 years children spent 8 to 12 minutes per waking hour engaged in pretend play.

With respect to social class, Smilanksy (1968) observed that in Israel, children from lower classes engaged in much less pretend play than those from the middle class, a finding that has held up to varying degrees in other populations (Doyle, Ceschin, Tessier, & Doehring, 1991; Fein, 1981). This has been challenged on the grounds that lower-class children might simply be delayed in the expression of pretend play, such that it peaks at 6 to 8 years rather than at 3 to 5 years of age (Eifermann, 1971). McLoyd (1982) suggested that availability of play materials and other situational factors could be responsible for the difference at younger ages (see also Fein, 1981). However, such situational factors are developmentally meaningful; the fact that toys might be the source of play differences does not mean the play differences should be discounted. Others have noted that the presence of strangers during coding could reduce the amount of play seen in some communities (Schwartzman, 1978), which is a methodological issue. But even when attempting to use familiar observers,

researchers have also noted that at a given age, children of lower parent income and/or education levels (which tend to move together) pretend less than those from higher levels (Göncü, Mistry, & Mosier, 2000; Tudge et al., 2006).

In sum, there are cultural differences, including socioeconomic "culture" differences, in the amount of time children spend engaged in play. Middle-class American and European children, with whom the vast majority of research on play has been conducted, are on the high end of a continuum of play engagement time across cultures. In addition, the fact that researchers also tend to come from these cultures means that the categories of play coders look for across cultures often are limited to forms that are most prominent in middle-class America and Europe.

Play Partners

Children's most frequent play partners also vary across cultures. In Euro-American culture, as was noted earlier, parents frequently are play partners until children are Ages 3 to 4, after which children play more often with siblings and peers. Similarly, in Japan (Bornstein, 2007) and Taiwan (Haight et al., 1999) parents frequently play with young children. In contrast, in much of the world parents are not viewed as appropriate play partners for young children (Callaghan et al., 2011; Farver, 1993; Farver & Wimbarti, 1995; Rogoff et al., 1993). In what is termed "alloparenting" (Hrdy, 2009), in many cultures siblings take over childcare responsibilities as soon as infants begin to locomote, and thus will no longer spend the day strapped to the mother's body as she works. In a study of over 100 cultures, 40% of infants and 80% of toddlers were cared for by someone other than the mother (Weisner et al., 1977).

Sibling play is not as sophisticated as mother play in terms of attunement: the skill with which one play partner reads and responds to another's signals during an interaction. Although some mothers do not attune well (Haight et al., 2006), most middle-class mothers are well-attuned, and as such can and do scaffold their children's play to ever-higher levels (Haight & Miller, 1992; Lillard, 2011). In contrast, sibling play is characterized by older children assigning roles to younger ones, and even telling younger sibling what to say in pretense scripts (Dunn & Dale, 1984). These differences in play partners could lead to differences in the quality of children's play across cultures, with children's play advancing more quickly in cultures where parents provide scaffolding. Father play also varies by culture, such that fathers are more engaged in some cultures and more distant in others (Roopnarine, 2011). In addition, whereas father play in the United States is often physical, Asian fathers (like typical mothers everywhere) engage in little physical play (Roopnarine, 2011). These differences in play partners could in part be responsible for differences in the play of children.

Types of Play

The types of play in which children frequently engage also vary by culture. In much of the world, children's pretend play tends to involve re-enacting adult work and adult rituals (Martini, 1994; Roopnarine, 2011; Roopnarine, Hossain, Gill, & Brophy, 1994). For example, children might pretend to pound manioc into flour, or engage in dancing rites, or reenact court cases (Lancy, 1996). Cultures differ in the extent to which children imitate adult activities, probably because in some cultures (like the modern United States) those activities are often not visible for children. In addition, whereas in many cultures a good deal of children's time is spent observing adult activities, in the United States children are often engaged in their own activities (with adults watching) or they are engaged with screens or their own toys. Cultures also differ in the extent to which they supply children with toys with which to play. For example, there is little object play in Kpelle culture (Lancy, 1996), and although Yucatec Mayan infants do play with objects, their play is less complex than that of U.S. children (Gaskins, Haight, & Lancy, 2007). With respect to pretend play, Haight et al. propose that although using objects in play is a cultural universal, the centrality of objects in that play varies. For example, as compared to the United States, Taiwanese children's pretend play is less focused on objects and more focused on scripted routines (Haight et al., 1999).

Parent Beliefs About Play

Adults vary in their beliefs about what activities are important for children's development (including whether and how adults can influence their development), and whether play is a useful activity for children. These views undoubtedly go on to influence whether children are given time and space and materials for play (and if so, what sorts), as well as whether parents play with children. Indeed, the more mothers think pretend play is important for development, the more mothers engage in it with their children (Haight, Parke, & Black, 1997).

As described by Gaskins, Haight, and Lancy (2007), play can be culturally cultivated, tolerated, or discouraged. In Euro-American and Taiwanese cultures, toys, time, space, and play partners are provided to encourage children to engage in play. The degree of encouragement varies even within those two cultures: In Taiwan, children have a

shelf of toys; in the United States, entire rooms are devoted to housing children's toys (Gaskins et al., 2007). American parents begin to pretend with their children before children pretend on their own, and thus they usher in the onset of this activity (Haight & Miller, 1993).

Kpelle parents accept play, yet regard it as exclusively children's activity (Lancy, 1996). Girls Ages 6 to 10 are responsible for caring for younger children, and hence tutor them in play. Girls of these ages are considered too small and weak to help with real subsistence work, but by keeping younger children out of the way of the adults who are doing subsistence work, the girls contribute to the family. Pretend play is common in such exchanges, beginning at Ages 4 to 5, and often includes scripted reenactments of adult activities.

The Yucatec Mayans curtail play in several ways (Gaskins, 1999). Their physical housing arrangements are one reason for this. Children are raised in family compounds where they are not likely to have agemates with whom to interact. Play is also socially curtailed because it is not encouraged in the culture. For one, fiction is not valued; truth is. The important business of the culture is getting work done, and as soon as children are sufficiently mature for a task, they are given it. Children appear proud to engage in such work and willingly abandon play to do so. Adults view play mainly as a distraction for young children who are not yet fit to work. Yucatec Mayan adults do not participate in play, nor provide materials, time, or space for it. Despite this, Yucatec Mayan children do play. Gaskins (2000) observed children in play 25% of the time from Ages 0 to 2, 39% from 3 to 5, and 27% of the time from 6 to 8 years. Interestingly, this latter period was their high season of *pretend* play (2–3 years later than it is seen among Euro-American children), consuming half of all play time. Their pretend play tended to consist of reenactments of six to eight set themes, like going to the store (Gaskins et al., 2007).

Cultural differences in parents' attitudes to play could be associated with schooling and/or cultural values concerning creativity. Schooling involves abstract thought (Greenfield & Bruner, 1973) and, as discussed earlier, pretend play is believed to promote abstraction and creativity. In the United States, where these constructs are valued, play is also valued.

In addition to play generally, what particular kinds of play are prominent in a culture depends on cultural values. Cultures where a higher value is placed on creativity would be expected to particularly value play that incorporates novel scripts including fantastical themes, as is more often seen among American children, as opposed to the playing out of set cultural scripts, which is more common in Korean children's play (Farver & Shin, 1997).

In sum, cultures vary in the extent to which they encourage pretend play, and although it occurs in all cultures, pretend play occurs later where it is discouraged. In addition, the types of play in which children engage reflect the values of the parent culture.

FUTURE DIRECTIONS

Throughout this chapter 1 have raised issues that I think are prime for further research in the coming years. In this section I expand on some of these and speculate on others. Specifically, I discuss new work and outstanding questions concerning how play might be changing, why children play, and pretend play in middle childhood and beyond.

Changing Modes of Play

Children's play is believed to be changing (Elkind, 2007; Hirsh-Pasek et al., 2009; Zigler & Bishop-Josef, 2004), for at least four reasons: time, place, materials, and displacement by media. Regarding time, children today are given less free, unstructured time in which they might play (Hofferth, 2010). Higher income parents, in particular, schedule their children's lives around sports, music lessons, and so on, whereas in similar families 30 or more years ago children were more often left to play on their own. The impact of this change in children's play has been questioned (Larson, 2001), but it is often assumed to be negative.

Second, preschool was formerly regarded as a place to play and learn social skills; today it is more often seen as a place to improve school readiness skills, with particular emphasis on reading and math (Bassock & Rorem, 2013, April). This might not be a bad thing: Children in preschool classrooms in which their learning is guided show better preparation for school than do children in classrooms that are based more on free play (Chien et al., 2010), but it is a topic of debate.

A third change over the past 40 years or so has been that when children do play, they play with increasingly structured toys; LEGOs, for example, were originally plain blocks to be put together; now LEGOs come with pieces that can only be constructed one way into specific objects. Such changes might have consequences for play, as children in some studies pretend more with less structured toys (although boys play longer with more structured

ones; McGhee, Ethridge, & Benz, 1984; Pulaski, 1973); however, toys like blocks do pull more for constructive than fantasy play (Pellegrini & Perlmutter, 1989).

A fourth source of change in children's play is media. From 1996 to 2003, American 6- to 12-year-olds' television time increased slightly, from 13 to 14 hours/week (Hofferth, 2010), but recent increases among younger children are much greater. In 2003, children Ages 6 months to 6 years spent an average of 2 hours/day with media (Rideout, Vandewater, & Wartella, 2003); in 2011, children Ages 2 to 8 spent on average 3 to 3.5 hours per day (Commonsense Media, 2011). Recently, there has also been a dramatic increase in the number of children who are playing with electronic devices, from LeapFrog to iPads. Little research has explored the impact of these changes in play on children's cognitive outcomes, but some studies find positive associations (Hofferth, 2010). Despite all these cultural changes relevant to children's play, one study detected no change over time in the quality of children's play from 1985 to 2008 (Russ & Dillon, 2011).

Over history, new forms of media entertainment have typically been viewed as potentially harmful to children (Critcher, 2008). When books became widespread, people worried that reading made children ill. Even in the early 1900s, G. Stanley Hall (1911) and John Dewey (1972) both recommended children not learn to read before Age 8. In the 1950s, parents were concerned about "comic book addiction" (Ilg & Ames, 1951, p. 240). As television became prominent in the ensuing decades, people worried about its effects (Winn, 1977). Today, parents and researchers are also concerned about computers and other electronic devices (Healy, 2011). These issues are discussed in the chapter on media (Anderson & Kirkorian, Chapter 22, this *Handbook,* this volume); relevant here is that play time is displaced by time with newer media, just as it was previously displaced by reading (although there are arguments against this, see Huston, Wright, Marquis, & Green, 1999). Further, the average amount of time children spend engaged with books does not approach the average amount of time children spend with screen media today (Vandewater et al., 2007). Therefore play time displacement is potentially much greater with screen media.

To the extent that play was previously displaced by reading and is now being displaced by screen media, it is important to consider how reading and television might render different experiences. For example, when adult-directed television is on in the background, children's play becomes less sustained and focused (Schmidt, Pempek, Kirkorian, Lund, & Anderson, 2008); having an adult reading in the background does not seem likely to change play in these ways. After children watch fantastical television, their executive function is impaired, relative to when they play, draw, watch realistic television, or read books—even a book containing the same characters as the television show (Lillard, Drell, Richey, Boguswski, & Smith, 2014; Lillard & Peterson, 2011). On the positive side, videogame play increases hand-eye coordination (Bavelier, Green, & Dye, 2010). Such differences suggest that changes in children's play and other leisure activities might influence their development in important ways.

Why Children Pretend

Another important future direction is to discover why children play at all. Because it is particularly characteristic of human play, pretending is especially challenging to study in this regard. We have been able to deprive other animals of play to examine outcomes, but because other animals engage in little to no pretend play, we cannot have animal models for this activity. Given that people need to adapt to reality for survival, why is childhood a time when children willingly misconstrue reality, for fun?

Evolutionarily speaking, pretend play might be derived from play fighting, which does serve useful developmental functions such that it could reasonably be selected for among mammals (Pellis & Pellis, 2009). Play fighting necessitates signaling that one is engaged in just-play; play fighting behaviors thus must be interpreted at two levels, the actual and the symbolic, or the "bite" that was given, and the bite for which it stands (G. A. Bateson, 1972). This two-level aspect of play is where most animals stop (Mitchell, 2002). But perhaps in humans, coupled with other endowments that led to language, the two-level skill mapped onto symbolic capabilities and became generalized. Symbolic behaviors emerged independently in some other species, for example birds and monkeys which have different calls to signal different situations (Griesser, 2008). Thus, play-fighting is conceptually linked to signaling how to interpret an action, as pretend or real, and within play fights, play acts are symbols for real acts.

The first "play" of human infants that has a pretense quality is what Reddy (1991) referred to as "teasing and mucking about" (p. 143). At the end of the first year, as other symbolic abilities emerge, the ability to use one gesture to signal another becomes a tool of wide application. For example, in play fighting, the fake bite signals the real one, and in play feeding, the empty spoon at the toy duck's mouth signals real eating. Children seem compelled to play

out this ability to use one gesture or object to mean something (for real, as in language, as well as in pretend). Why do human children do this?

One possibility is that they do it merely because it is fun. A second possibility is that children pretend to exercise imagination, going beyond the present situation. This ability to go beyond the present is helpful in tool use, planning, and many other key human skills (Tomasello, 2008). Perhaps practice at using this ability in pretense confers a more generalized ability to do a better job of going beyond the present. Gopnik and her colleagues are examining this possibility in their research on pretend play and causal reasoning (Buchsbaum et al., 2012; Schulz & Bonawitz, 2007).

In sum, we do not know why children engage in different forms of play, including pretend play. Pretend play might have emerged as a by-product of play fighting, which evolved in animals because it helped to hone fighting skills. Play fighting involves signaling that one is only playing, and these signals and the accompanying play acts share the structure of other symbolic acts. An additional possible reason for pretend play is to exercise the imagination, which could help with other activities like problem solving.

Play Across the Life Span

Another area in which further research could be especially fruitful is how play evolves after its "high season" in years 3 to 6. Piaget and Vygotsky both claimed that pretend play ceases around the time that children enter elementary school. Recently, some theorists have expressed doubt about this claim (Göncü & Perone, 2005; J. D. Singer & Singer, 1990). For example, children clearly have imaginary companions after age 6 (Hoff, 2005; Taylor et al., 2010).

To examine pretend play across childhood, E. D. Smith and Lillard (2012) conducted a retrospective survey asking university undergraduates how much they pretended as children, when they stopped pretending "like a child," and various questions about their pretending across 2-year segments of their childhood. First, the average age at which people ceased to pretend like a child was 11 years, 3 months, with 61% reporting that they still pretended at least weekly or even daily at Ages 10–11. A full 48% of the sample was still pretending into the Formal Operations stage as suggested by their ages (over 12 years old). Regression analyses indicated that ceasing to pretend at older ages was predicted by being male, growing up in a more rural environment, having younger but not older siblings, pretending alone, and believing in fantastical entities like Santa Claus. In addition, 38% of respondents reported still pretending in some way as an adult, for example pretending to be a famous singer or the richest person in the world. Most of these later pretenses were related to entertainment, identity change, or deception, in contrast to early pretense, which concerned fantasy, play fighting, and reenacting daily life events.

Psychologists are also recently taking an increasing interest in paracosms, or imaginary worlds, created often in middle childhood (Cohen & MacKeith, 1991). During this life phase, some children construct communities, often replete with elaborate maps and props, and spend countless hours engaged playing in these worlds (Root-Bernstein, 2013). Piaget's son Laurent had such a world (Piaget, 1962, Obs. 92). The study of pretend play across childhood is likely to be an interesting direction for future research.

CONCLUSION

Play is very difficult to define, although considering how to do so is a useful exercise for deepening one's appreciation of its many varieties and nuances. Although historically Piagetian approaches to play have predominated, Vygotsky's analysis is more prominent today. This is in keeping with a general movement in the field towards social-cultural frameworks (Tomasello, 2008). Within these frameworks, and also coupled with ethological theory, the understanding of play has advanced a great deal in the past 30 years. The discovery that children with autism, who engage in little spontaneous pretend play, also are delayed in theory of mind (Rajendran & Mitchell, 2007), and the association of pretending with theory of mind in typically developing children, served as an engine for research in this area, leading to research not just on theory of mind but also on signs of pretense and symbolic understanding. Advances have also been made with regard to how children negotiate the real-pretend boundary, and when and why that boundary sometimes seems to break down. We also know much more than we used to about how children are initiated into pretend play. Interindividual differences in play according to culture and other variations in childhood experiences have also been a subject of study.

The role of pretend play in development is still questioned today, and individual differences in play, from atypically developing children to observations of difference in play in different cultures, raise interesting questions about its possible role. Pretend play is a fascinating and

fun childhood activity that extends into middle childhood, and for some even into adulthood. Further study should reveal much more about what it reflects about, and what it means for, individuals' cognitive development. Children's play is changing as preschools increasingly emphasize academic skills, parents schedule their children into other activities, and electronic media devices replace hands-on materials. Further research is needed to show how these changes will influence children's development in the future.

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